The Analysis of Macroeconomic Trends of Financing Healthcare System in Uzbekistan

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*Abstract.***The article analyzes the theoretical basis of financing the health care system and the specific features of providing social policy for its development. The possibilities of using result-oriented budgeting are justified. Based on the research, scientific proposals and conclusions aimed at improving the theoretical issues of financing the healthcare system were developed.**

Keywords: Medical service, social policy, healthcare, state budget

1. INTRODUCTION

Medical services have a special importance in the implementation of social policy in our country. In this, the state implements the financial policy of medical services to the population from several points of view.

First, the provision of primary medical services free of charge at the expense of the state budget. In this case, budget funds are allocated to primary medical institutions based on the number of attached population, taking into account all strata of the population.

Secondly, provision of financing of inpatient medical services for a certain segment of the population at the expense of the state budget. In this case, the state, in the implementation of the social protection policy, determines the socially categorized strata of the population for medical services.

Thirdly, the state implements the provision of paid medical services through inpatient medical institutions. This is represented by the delivery of medical services in a competitive environment for all segments of the population.

Fourth, it regulates medical services provided by non-governmental medical institutions through both financial and medical criteria. In this case, it is considered appropriate for the state to prevent the price of medical services from becoming monopolistic. It also ensures the effectiveness of social policy through fiscal regulation of the financial activities of non-state medical institutions.

2. LITERATURE REVIEW

In the studies carried out by N. Kunibe and others, trends related to the introduction of the "performance-based financing" method are analyzed [1]. Its introduction has seen an increase in results month by month. It can also be observed that this method has been introduced in more than 30 low- and middle-income countries in the last decade. In their research, they suggest evaluating the effectiveness of medical services provided free of charge at the expense of the state budget. They include maternity and childhood medical protection, development of young children, and vaccination coverage.

In our opinion, result-oriented budgeting can be classified in terms of the formation of indicators. First, there is a system of indicators that serves to form results, and secondly, there is a system of indicators that expresses results. From this point of view, the experiences of the countries will have mutually compatible and different factors.

In 1980-1990, activity-oriented budgeting principles were introduced. The introduction of this method created an opportunity to develop from the form of pre-funding of medical services that are not provided to the principle of financing of provided medical services.

U-G. In the research conducted by Gerdzam and others, it is justified that the method of activity-oriented budgeting is much more efficient than budget financing in Sweden [2]. According to them, financing methods based on services rendered are more effective than pre-financing services.

In the research conducted by G. Kastberg and others, it is emphasized that in the Swedish experience, activity-oriented financing served to increase the waiting time of medical services and its effectiveness [3].

Dissertation research on result-oriented budgeting was carried out by K. Ernazarov. He tried to develop scientific conclusions and proposals based on approaches to the field of education. According to him, " the state has implemented reforms in the trends related to the development of NYB methodology and its implementation for several years. In particular, the fundamental changes in the budget policy did not allow for the formation of a unified approach as a

result of mutual negation [4]".

Among the researchers, Assoc. A. Sherov notes in his scientific conclusions about the different aspects of result-oriented budgeting and estimated financing [5]

Russian scientists researched specific aspects of result-oriented budgeting and formulated scientific conclusions. In particular, in his research, S. Khabaev analyzes the priorities of introducing this methodology in the healthcare system. According to him, in the development trends of the healthcare system, approaches have been developed regarding the formation of the number of doctors, nurses, number of hospitals, number of beds and number of primary medical institutions in relation to the total population. Also, S. Khabaev, the result-oriented budgeting process 1) budgeting goal setting; 2) event planning; 3) implementation of plans; 4) performance accounting and control; 5) analysis; 6) formation of management activities; 7) suggests steps such as revising goals and plans [6].

In his research, M.Ravallion tries to evaluate the importance of life expectancy in calculating the international human development index. In his opinion, he notes that life expectancy is less important in low-income countries than in high-income countries [7].

In the research carried out by S. Morrison et al., he analyzes the development trends of human capital and average life expectancy in the world economy in 1870-2000 [8]. In particular, as the average income and level of education increases in countries, the average life expectancy also increases. In conclusion, the increase in GDP in the country creates the need or conditions for an increase in average life.

3. RESEARCH OBJECTIVE AND METHODS

Theoretical views are systematized in the implementation of the research. They are formed on the basis of methods that allow comparative evaluation of theoretical conclusions of empirical studies. Theoretical and scientific conclusions are formed on the basis of research.

4. ANALYSIS AND RESULTS

We will analyze the development trends of various sources in the financing of medical services and their role in ensuring macroeconomic stability.

Table 1: Indicators of the Republic of Uzbekistan in 2006-2023 , bln . soum

Indicators	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
State budget	4 388.4	5 823.8	8 197.1	10,764.7	13 386.9	16,726.0
Social sphere	2 281.0	3 002.4	4 443.2	5 896.7	7 835.9	9 704.9
Health care system	508.8	650.8	934.1	1 259.8	1 716.5	2 226.7
Years	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
State budget	20,882.0	25,825.9	31 425.4	36 257.3	40 911.3	49 343.7
Social sphere	12299.9	15 147.0	18 493.7	21 316.9	24 101.6	27,009.3
Health care system	3 024.9	3 709.9	4 507.2	5 218.5	5 811.6	7 330.0
Years	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
State budget	79736.1	118008	144142	188257	236692	257734
Social sphere	42883.3	63542	74231	92013	117691	129891
Health care system	9408.4	14977	19397	19648	22788	28426

Source: prepared on the basis of decisions of the President of the Republic of Uzbekistan on budget parameters, statistical data of the Ministry of Economy and Finance

In our opinion, it can be seen that the role of budget expenditures in the financing of medical services is important in Uzbekistan. From 2006 to 2010, health care spending experienced steady growth, but until 2016, it reflected a period of stagnation. In 2016-2023, it can be observed that there have been significant positive changes, such as reforms in the health sector.

In 2006, the budget expenditures of the healthcare system amounted to 508 billion. amounted to 28.4 trillion soums by 2023. it should be noted that it reached soum. If this change was 56 times, it can be observed that in 2023 it increased by 6 times compared to 2016 . This reflects the fact that significant attention is being paid from the state budget to the health sector (see Table 1).

In our opinion, it is no exaggeration to say that significant changes in health care system costs after 2016 are also related to the development of the non-state medical services sector during this period. From this point of view, the tendency to reduce the financial burden on the state budget allows for emergence. We think that this helps to develop a competitive environment in the market of medical services through the participation of non-state medical institutions in the field.

To determine the relationship between health system budget costs and other indicators, we considered using the Pearson coefficient. Therefore, we try to estimate the correlation between two indicators by the following formula 2.1:

$$r_{xy} = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i-1}^{n}(x_i - \bar{x})^2}\sqrt{\sum_{i-1}^{n}(y_i - \bar{y})^2}} \quad (2.1)$$

In this case, r is the correlation coefficient, n is the number of observations, and x,y are two corresponding indicators.

The relationship between health system budget expenditures and other relevant indicators can be seen with the coefficient (r) as follows (computer software was used to calculate the correlation coefficient):

1. Correlation with total expenditures of the state budget is equal to 0.769. This relationship reflects a strong positive relationship.
2. The correlation with social sector expenditure is 0.781. This relationship reflects a strong positive relationship. In turn, the influence of the social sphere on the state budget is increasing.
3. The correlation with expenditures for medical services in the composition of payments for total services in the country is equal to -0.84, indicating a strong negative correlation.

Based on our research, we tried to formulate the following scientific conclusions:

- the share of health system budget expenses has a tendency of uniform change. the role of social policy in financing medical services from the budget is becoming important. the impact of social policy is higher than that of budget policy;
- it can be observed that the average per capita expenditure of the healthcare system has increased in recent years;
- the trend of changes in social sector expenses has a more significant impact on the volume of financing of the healthcare system from the budget compared to the general budget expenses;
- changes in budget expenditures in the health care system are significantly inversely related to payments for non-state medical services. In the market of medical services, payments that are not financed by the state are financed by private sources (out-of-pocket expenses of citizens). We believe that this creates the need to regulate services that are financed out of pocket by the state.

In our opinion, it is appropriate to determine the mutual ratio of budget and out-of-pocket costs in the financing of medical services and to focus on the development of a healthy competitive environment between state and non-state medical services based on them. We think that it is important to develop uniform standard criteria for the quality of medical service and its price.

Table 2: Development trends of the macro-indicators of the healthcare system of Uzbekistan

Indicators	**2011**	**2012**	**2 013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Health budget expenditures, bln. Soum	2226.7	3024.9	3709.9	4 507.2	5 218.5	5 811.6	7 330.0	9408.4	14977	19397	19648	22788
Hospital facilities, number	1181	1225	1128	1058	1071	1106	1135	1165	1205	1232	1281	1328
Number of hospital beds , thousand	139.8	138.3	134.0	130.9	129.7	132.0	135.7	153.6	153.4	161.0	165.5	166.9
Total number of patients treated in inpatients, thousand	4909.9	4974.7	5150.3	5294.0	5293.9	5581.5	5984.8	6235.6	6154.0	5532.1	5926.1	6952.5
Number of outpatient clinics	6354	6389	6421	6054	6220	6542	5296	5627	5955	6032	6676	7010
Capacity of ambulatory polyclinic institutions , number of trips per shift , thousand	423.7	424.3	418.5	406.7	407.0	411.9	405.3	440.8	468.6	682.6	461.3	508.0
Population per physician	362	369	373	378	379	382	383	367	369	370	369	358
Number of population per midwife	92	92	93	93	94	94	94	92	92.7	93	95	94

Source: Formed on the basis of information from the Ministry of Economy and Finance of the Republic of Uzbekistan and the Statistical Agency under the President of the Republic of Uzbekistan

We will continue our research with the analysis of the development of some macro-indicators of the healthcare system. We will analyze the development trends of indicators such as the number of hospitals and the number of doctors.

In 2012-2015, it can be seen that the number of hospitals decreased. Correspondingly, the number of beds in the hospital also showed decreasing trends. This can be explained by the reduction of the category of state medical services in the market of inpatient medical services and the increase in demand for non-state or foreign medical services. As a result, the need to increase the import of medical services in Uzbekistan increased, and the net export of medical services changed from 0.08 to -24.71 in 2012-2016. In our opinion, it is possible to influence the stability of the balance of payments by coordinating the market of local medical services by the state (see Tables 2 and 3).

In turn, we will analyze the correlation between the budget financing of the healthcare system and the number of hospitals (and places in them) using the Pearson coefficient. In this case, we use the method given in formula 2.1. On the basis of the analyzes carried out on the basis of computer software, it is possible to observe the state of interdependence with the financing of the health care system from the budget as follows:

1. The correlation with the number of hospitals is r = - 0.185. This correlation reflects a non-significant negative relationship.
2. The correlation with the number of hospitals is r = - 0.253. This correlation reflects a non-significant negative relationship.

It should be noted that the correlation coefficients help to determine that less funds are allocated from the budget for such trends as the development of the material and technical base of hospitals and their construction in the financing of the healthcare system from the budget. We think that this reflects the need to ensure a stable relative balance between groups of expenditure estimates in the budget.

In general, based on the data in Table 2, we will also analyze the relationship between the number of beds in the hospital and the changing trends of patients treated in them, and try to find the average rate of using one bed per day. When we use the Pearson coefficient method, we can observe that the degree of correlation between them is r = -0.248 possible We believe that this correlation coefficient indicates that the use of beds by patients is not in accordance with the standards of medical care, which affects the effectiveness of medical care.

In the financing of inpatient medical services from the state budget, he expresses the need for financing within the criteria of result-oriented budgeting. Therefore, it is appropriate to develop financing taking into account non-monetary factors (for example, the number of beds in hospitals, the number of treated patients and the rate of use of beds).

In our research, we analyze trends related to primary care services. In the case presented in Table 2, it can be observed that the number of outpatient polyclinic institutions and the number of visits to them are developing in a mutually dependent manner. This can be attributed to their classification, in other words, to the emergence of institutional changes in the provision of primary medical services. It can be observed that if they reflected unstable trends until 2016, then from 2017 they reflect a state of flat development.

In particular, in 2016-2017, the number of ambulatory-polyclinic institutions changed from 6542 to 5296, according to the decision of the President of the Republic of Uzbekistan dated March 29, 2017 " On measures to further improve the organization of primary medical and sanitary care institutions in the Republic of Uzbekistan" No. PQ-2857 is directly related.

Continuing our analysis of the correlation between monetary and non-monetary indicators, we will try to determine the relationship between the number of outpatient clinics, the number of visits to them, and the total funding volume. In this case, using the Pearson coefficient method (based on formula 2.1), it is possible to see the following trends and form scientific conclusions based on them:

1. The correlation coefficient between the financing of the health care system and the number of outpatient clinics is equal to r = 0.592, which represents a positive moderate correlation.

The relationship between the budget financing of ambulatory polyclinics and medical services represents a moderate relationship, and it can be observed that the cost financing method is more applicable than the essence of result-oriented budgeting. The reason for this is the instability of state inpatient medical services that we mentioned above. If primary health care services are outcome-oriented, the demand for inpatient health care services should decrease.

2. The coefficient of correlation between the financing of the health system and the number of visits to outpatient clinics is equal to r = -0.659, which represents a negative moderate correlation.

The negative relationship between the number of visits to the outpatient clinic and the financing of general medical services from the budget can be explained by the fact that primary medical services are based on the per capita financing method. This shows the need to take into account other indicators for the econometric analysis of the

importance of using the coefficient of correction for the age of the population attached to the primary medical institution in per capita financing of primary medical services . We will try to evaluate the analyzes taking into account these indicators in the next paragraphs of our research.

3. The correlation coefficient between the number of outpatient clinics and visits to them is equal to r = 0.844, which represents a strong positive relationship.

It can be concluded that the control of non-monetary factors is evenly organized due to the strong positive correlation between ambulatory polyclinics and visits to them. This shows that although there is compliance with the rules set in the cost-based financing method, the outcome criteria are not expressed. Here, too, the instability of inpatient medical services serves as a basis.

It can be seen that the services market is developing in Uzbekistan. In particular, the volume of total services in 2010 was 27.1 trillion. if it was soums, in 2022 this number will be 366.9 trillion. equal to soum. In the analyzed period, the share of these numbers in relation to GDP was 34 percent and 41 percent, respectively. On the other hand, in terms of economic activity of health services in 2010, 258 bln. if it was soums, in 2022 it will be 6.6 trillion. amounted to soum. In the studied period, the share of these indicators in relation to GDP was 0.33 percent and 0.74 percent, respectively 1.

In our opinion, it has been noted by many scientists that as the market economy develops, the services market expands as well. Therefore, it is reasonable to say that significant changes are taking place in the market of medical services. On the other hand, a hypothesis is formed that the tenancy of payments for medical services may be developing based on the population's out-of-pocket costs. The possibility of high out-of-pocket costs in the formation of this trend can be expressed by the fact that the health insurance mechanism is not fully functioning.

In general, it should be noted that the role of funds allocated from the state budget in the market of medical services is important. 28.4 trillion from the state budget in 2023. soums of funds were allocated, it can be observed that these funds make up 81.2% of the total expenses for medical services in the country (6.6 trillion soums (non-state sector) and 28.4 trillion soums (state sector)). It can be seen that 1/5 share of the market of medical services is provided by private sector medical institutions.

In our opinion, the increase in the share of private medical services in the market of medical services represents a positive correlation. In this connection, it can be seen that the population's funds for medical services represent a uniform development trend.

Table 3: Volume of population incomes and medical services payments, bln. soum

Years	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Population income	62632	85933	104263	126268	146393	169344	197962
Volume of medical service	258	354.4	498.8	671.9	869.9	1100.4	1416.3
Net export of medical services, mln. US dollars	-0.24	0.03	0.08	0.12	-14.56	-20.14	-24.71
Years	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023 (III quarter)**
Population income	236893	300843	365736	414969	519181	634797	
Volume of medical service	1701.5	2220	3104.3	3386.7	5105.9	6613.1	
Net export of medical services, mln. US dollars	-30.68	-31.83	0.62	-0.16	0.36	1.18	3.83

Source: Formed based on the information of the Statistical Agency under the President of the Republic of Uzbekistan and the Central Bank of the Republic of Uzbekistan

In turn, the assessment of the relationship between non-state medical services and income of the population helps to find answers to the question whether the growth of non-state medical services depends on monetary factors or the role of non-monetary factors is important. In doing so, we will try to evaluate the correlation between the size of the population's income and payments for medical services through the Pearson coefficient.

[1] Calculated based on the data of the Statistical Agency under the President of the Republic of Uzbekistan

In this case, we set payments for medical services as Y as an arbitrary variable, and population income as X as an independent variable. This makes it possible to assess the impact of population income on medical services. We systematize these indicators using statistical data presented in Table 2, respectively.

When we determine the Pearson correlation coefficient through computer software, it can be determined that the relationship between them shows a negative weak correlation. In particular, it should be noted that the correlation coefficient is r = -0.173.

Continuing our research, we will also consider the analysis of imports of medical services. In doing so, we try to estimate two independent correlations between population income and volume for medical services and the volume of net exports of medical services.

In this case, we estimate the degree of correlation based on the determination of the Pearson coefficient. In this case, we designate the net export of medical services as Y, and the other two indicators as X, respectively. If we calculate the correlation coefficient through computer software, we can see the following situation:

The correlation coefficient between the net export of medical services and the income of the population is equal to r = 0.474, and it should be noted that the correlation between them is positive and represents the correct proportional change. Also, the correlation between the net export of medical services and the volume of payments for medical services is equal to r = 0.874. This coefficient reflects the strong significance of the relationship between these indicators.

In our opinion, the fact that medical services express such a relationship from a quantitative point of view shows the need to take into account their qualitative evaluations as well. A direct proportional relationship between the net export of medical services and the increase in citizens' income indicates that there is a tendency to prefer foreign medical services over domestic medical services. Nevertheless, it should be noted that since 2019, the increase in the volume of private medical services in the country has led to a positive balance in the country's balance of payments net export of medical services (0.62 million US dollars, see Table 2.2). It is noteworthy that this served to prevent the outflow of foreign currency in the country.

In our opinion, net exports of medical services had a significant negative balance in 2014-2018. It can be assumed that the formation of this trend is related to the quality of medical services. With the implementation of the Action Strategy for the Development of the Republic of Uzbekistan, which began in 2017, the reforms began to bear fruit by 2019. had a positive balance of USD. We tried to justify this relationship by determining the Pearson coefficient.

5. SUMMARY & CONCLUSIONS

Based on our research, we were able to formulate the following scientific conclusions:

The volume of payments for medical services as a percentage of the country's GDP is steadily growing;

Although the share of the private sector in the market of medical services is increasing, the role of state budget funds remains significant;

The share of medical services in the total services also reflects the trend of steady growth, indicating the nature of the increase in the share of the population's consumption expenses;

An increase in the income of the population does not have a positive effect on the payments for medical services, which means that the income of the population does not direct the costs related to the prevention of their health. Therefore, a conclusion is formed that the population turns to non-state medical services for emergency medical services when there is a demand;

The formation of a tendency to receive medical services in foreign countries indicates a low tendency to receive local medical services. This is expressed by the fact that the balance of payments on the net export of medical services had a negative balance until 2018;

While the increase in demand for private medical services in the country has led to an increase in out-of-pocket costs, it has created conditions for a decrease in demand for foreign medical services. As a result, the currency flow in the country has a positive balance .

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