Features that Increase Efficiency in the Provision of Medical Services and Factors Affecting Them

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Abstract

The article presents econometric and empirical models of medical care for patients living in remote areas. A scheme for systematic imitation of econometric modeling of the sphere of Public Services has been developed. One of the medical services is the health insurance of the population. The article provides an overview of the functions of health insurance options. The development of econometric models of medical services in order to determine the optimal solutions for the provision of medical services in our country, technological progress, the solution of painful problems in medicine, the improvement of human life.

Keywords: digital technology,   empirical model,   econometric model,   forecast results, information system, endogenous variables, exogenous variables.

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1. Introduction

In our country, the health of the population is one of the most important factors in the level of socio-economic development and an integral element of labor productivity in society. While technological advances are addressing painful issues in medicine, unhealthy lifestyles in many countries are making life difficult for millions of people. Therefore, one of the optimal solutions is econometric modeling of medical care.

In international practice, extensive research has been conducted to improve health insurance. As a result, "32 of the 33 developed countries have introduced a system of general compulsory health insurance, which provides for the use of one of the compulsory health insurance".

According to the World Health Organization, almost half of the world's population is not fully covered by basic medical services. "More than 930 million people, or 12 percent of the world's population, spend at least 10 percent of their income on health care."

2. Analysis of literature on the topic

In our country, the health care system has new tasks for the development of health care organizations and the quality of medical services. The development of effective economic mathematical models and tools for the development of medical services is one of the most pressing issues today. The purpose of this study is to provide recommendations for improving the use of digital technologies in the market of health insurance services in accordance with modern requirements in health insurance practice and the economic-mathematical model of development of health care enterprises in the compulsory health insurance system (CMI). is to achieve financial results through construction. A number of foreign scholars have conducted research on the economic nature of health insurance services, the formation of medical insurance services, opinions and comments on the history and economic content, theoretical, practical and methodological aspects.

Erlangga D, Suhrcke.M, Ali.S & Bloor.K Systematically analyzed the impact of public health insurance on access to health care, financial protection, and health status in low- and middle-income countries [3]. Woolhandler, S., & Himmelstein, D. U. COVID-19 and lack of health insurance. He developed a chronicle of internal diseases [4]. Xie, Y., Valdimarsdóttir, U. A., Wang, C., Zhong, H., Gou, Q., Zheng, H., Lu, D. Health Insurance in Patients with Breast Cancer and conducted research to prevent the risk of cancer-specific death.

Political Entrepreneurs as Catalysts for Broad System Change: The Adoption of Social Health Insurance in India [5]. Kullberg, L., Blomqvist, P., & Winblad, U. Health insurance for the healthy? - Voluntary health insurance in Sweden. They have a health policy. Identified the impact of catastrophic health insurance on catastrophic health care costs for households.

According to the annual stratified norms of the compulsory health insurance system and the number of citizens attached to the medical organization, the financial resources of the medical organization must cover all the costs of the medical institution and provide quality services to the population [6].

Shishkin S.V., Sheyman I.M., Potapchik Ye.G., Ponkratova O.F. He analyzed the state of insurance medicine in Russia and the prospects for its development [7].

Roik V.D. He has conducted research on occupational accidents and temporary disability insurance. Fyodorova T.A. a two-pronged approach to the health insurance system is widespread: on the one hand, as an element of the state system of social protection, on the other hand, the financial mechanism for financing health care and providing funds for the payment of medical services [9] Kiseleva I.A. creates works aimed at solving the socially significant problem of tuberculosis among the population, optimizing the financial resources of medical enterprises, mathematical analysis and assessment of factors affecting cash flows [10,11,12]. But Kiseleva I.A. did not pay enough attention

to the specifics of health financing, mathematical modeling of the processes of providing financial resources of medical organizations as integrated corporate structures and small businesses.

Yegorova N.E. [20-21] focuses on multi-level management tasks using health expert expert assessments, simulation modeling, and optimization techniques.

Ermasov S.V. and Ermasova NB considers the health insurance system as a normative-legal form of organization of insurance relations, which implies the formation of the legislative framework, the organization of state control over insurance activities, the development of self-government processes holds. Health insurance is defined as a network of voluntary health insurance that provides for the formation of trust funds at the expense of enterprises, local authorities and citizens and their use to finance medical services to the population [22].

3. Research methods

The development of medical services in the regions of the country has not been studied as a separate object of study. The development of health insurance services, the theoretical aspects of health insurance, the practical analysis of health insurance have not been sufficiently studied in the work of scientists of our country. It is limited to the analysis of the infrastructure, organizational and legal form of the general insurance market and the analysis of insurance activities on a national scale. In the emerging insurance market, the issue of health insurance services and their improvement is not sufficiently covered. This means that this topic needs to be further explored. Baymuratov T.M. In order to improve the insurance activity and its taxation mechanism in Uzbekistan, it proposes to introduce advanced technologies of medical services using new media and information systems [23]. Bazarov Z.X. his scientific work describes the principles of compulsory, ease of use and equivalence of insurance in health insurance;

➢ clarified the criteria for the new insurance rate for health insurance;

➢ the procedure for concluding insurance contracts by an insurance company has been simplified;

Based on the study of the practical activities of foreign insurers, the process of digitization of health insurance in accordance with modern requirements in the practice of health insurance has been revealed [29]. Bazarov Z.X. In its work, several groups of health insurance are described in terms of revealing the economic nature of health insurance. The expansion of knowledge on compulsory and voluntary health insurance through the media in improving health insurance practices is focused on specific aspects that have been scientifically researched by economists and reveal relevant scientific-theoretical approaches.

However, the importance of compulsory health insurance in the market of insurance services in Uzbekistan and the principles of modeling the organization of compulsory health insurance have not been studied.

According to the results of the analysis, the grouping of different features of health insurance emphasizes its versatility, which reflects the following:

 1) the social significance of the health insurance relationship;

2) the role of the population in receiving medical care;

3) the importance of financing the health care process.

The health insurance system is a type of economic relations between insurance companies and the insured, which is regulated by law. mechanism. Broadly speaking, health insurance refers to social insurance, including pension insurance, types of insurance with a long-term savings function, as well as mutual insurance.

Chapter 52 of the Civil Code and adopted on April 5, 2002

The quarantine measures introduced in our country in connection with the pandemic also create

the need to further improve the mechanism of legal regulation of public health. In this regard, the President of the Republic of Uzbekistan said the following about the topic of the day: frankly speaking, today the whole world is at war with this dumb beast, an invisible enemy called the coronavirus. Every state and every nation involved in the war will take all necessary measures to protect its country and its people. First of all, it blocks the path of danger and establishes iron discipline. Moves to live and work in a highly mobilized environment.

Today we are in a similar situation. In the end, "... our main goal is for everyone, regardless of nationality, language and religion, to live a free, peaceful and prosperous life, to live a happy life today." We have a huge task ahead of us in this direction. The development of our country and the well-being of our people depend, first of all, on the effectiveness of our social reforms. [1]

Decree of the President of the Republic of Uzbekistan No. PF-4947 of February 7, 2017 "On the Action Strategy for further development of the Republic of Uzbekistan", No. PQ-4412 of August 2, 2019 "On measures to reform the secondary market and ensure its rapid development", No. PQ-4890 of November 12, 2020 "A new model of organization of the health care system and the mechanisms of state health insurance in the Syrdarya region Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated December 14, 2020 No 780 "On measures to improve the provision of electronic insurance services" Resolutions of the Government of the Republic of Uzbekistan dated December 31, 2019 No. 1060 "On measures to organize the activities of the Agency for Development of the Insurance Market under the Ministry of Finance of the Republic of Uzbekistan" This article is relevant to the implementation of the tasks set out in other regulations.

In order to gradually introduce compulsory health insurance in the country, the legal framework of the system is being developed this year. The introduction of this system in our country will begin in 2021, and first of all, compulsory insurance will be provided in large organizations.

Our analysis of the study shows that the existing scientific and methodological support of health care companies does not meet the requirements. It is necessary to develop the activities of health care organizations, improve the quality of medical care to the population and introduce advanced technologies to create conditions for the convenience of medical services.

Despite the high social importance of the health care system, the process of managing the development of health care enterprises can be described as inefficient. Because there are no integrated scientific and methodological approach models integrated into daily medical practice to implement healthy management.

The draft law on compulsory health insurance provides for the establishment of a compulsory health insurance fund. The bill also sets out the principles of compulsory health insurance.

➢ Principles of compulsory health insurance:

➢ equal access to medical services provided by all insured persons, regardless of their social status and the amount of contributions (contributions);

➢ equal access to medical services in the regions;

➢ affordable and quality medical care.

To better understand the system of compulsory health insurance in Uzbekistan, its advantages and disadvantages, let us first turn to foreign experience in the implementation of this type of insurance. It should also be borne in mind that health insurance in a country largely depends on the nature of the health care system, in other words, whether it is paid, free or combined.

At present, the bulk of the financial resources of health care organizations in Uzbekistan is provided by per capita financing. The new method of financing will be organized in accordance with the program of compulsory health insurance (CMI) in the regions.

Tariffs for medical services provided under the regional compulsory health insurance program include: salary costs, calculations for salaries of medical and medical staff, medicines, consumables

and semi-finished products, food, medical furniture and medical equipment, reagents and chemicals, services of third-party medical organizations, laboratory and instrumental research, transportation services, Internet, communications, utilities, storage of medical organization property, purchase of software and fixed assets, etc.

It follows from the above that the financial resources of the compulsory insurance system, which includes health care enterprises in accordance with the annual stratified standard and the number of people attached to the medical institution, should cover all costs for quality medical care.

The fundamental difference of this approach is that it is no longer profitable to increase the number of visits to the medical institution and the medical services provided, instead the prevention of the population becomes a priority. The better this is done, the fewer citizens will turn to outpatient and inpatient care, leaving more financial resources. This amount of funding can be adjusted to the number of citizens who are freely attached to a medical institution, taking into account the gender and age structure of the population and other factors that affect patients' need for medical care.

4. Results

The results of this study can be used in public and commercial medical institutions that provide paid medical services and in the compulsory health insurance system.

According to the characteristics of the organization of provision: primary health care (including the most basic (basic) treatment-and-prophylactic and sanitary-hygienic measures; care (provided in specially designed medical facilities).

Depending on the severity of the patient's disease: outpatient; shown at the hospital; shown in the hospital at home; shown in a day hospital; emergency medical care is provided.

According to the methods of medical care are divided into: manipulations; procedures; medical methods; medical intervention.

Each system of medical care includes its own elements of service, while at the same time reflecting the elements of the lower level of the system. In other words, the elements of the healthcare sector are also interconnected with different systems in many ways, without interfering with each other.

In ensuring the completeness of the system of medical services to the population, a systematic approach to each element of its structure is expedient.

To this end, the field of medical services to the population is considered a complex system, the laws of which are represented, the quantitative and qualitative aspects are studied. Imitation plays an important role in the analysis of the activities of the service sector, which is considered as a complex economic process.

An imitation model will be built for each sector in predicting the future state of the health care sector. To do this, perform the following tasks:

➢ Formation of a database of health care networks and factors influencing it;

➢ identify the relationship between each health care network and the factors that affect it, the factors that influence it;

➢ developing a separate model for each health care network;

➢ examination of developed models according to evaluation criteria;

➢ formation of a database forecast based on certain patterns of factors influencing forecasting through models considered important;

➢ achieving performance factors based on databases and models.

In this case, special functions are considered, attention is paid to the algorithms of system operation. By function, we mean the properties that lead to a goal. At the same time, the functions of the system are evaluated on the basis of a functional approach. Determining the activity of the system provides an opportunity to determine its status, the laws governing the management of systems.

An important aspect of this is the emergence of hierarchical subordination between these parts and is reflected in the relative independence of these parts. This will help the population to develop an integrated systemic model of all elements of its service sector on the basis of a single system.

It is expedient to study whether the factors influencing social phenomena correspond to different values, not the same, and that their interdependence is correlated. Because the characteristic feature of the medical service industry is that it is impossible to determine the full list (strength) of all the factors that affect this industry.

In addition, only approximate expressions of connections can be written using the formula. Because the number of factors influencing the field of medical care is so large, it is impossible to determine a complete list of them and write an equation that fully represents the relationship between the affected outcome sign.

The development of the health care sector is so incomplete that each value of the factors corresponds to different values of the outcome of the factor influencing the time and space. Hence, the exact number of influencing factors will be unknown. It is expedient to study such a relationship by means of correlations.

Our task is to assess the presence of strong and weak links that affect the development of public service networks. We use the correlation analysis method to accomplish this task. Because our goal is to assess the importance and reliability of the interdependencies that affect the development of any sector that provides medical services to the population. Through correlation analysis, we measure each dependency norm that affects the population's health care sector, but we cannot determine the cause of the relationship.

5. Discussion and conclusion

5.1 Discussion

It was found that the value of the DW criterion, which was calculated as an empirical model built for each branch of the medical service sector, was higher than the table value. This indicates that there is no autocorrelation in the resulting factor residues. The Fisher and Student criteria were calculated and the calculated value was compared with the table values, the magnitude of which was determined from the table values.

The results of the analysis of empirical models built for each sector of public services in the region are presented in the table.

In the models built for each service network (for linear regression equations), the considered parameters consist of different indicators. Therefore, it is necessary to calculate the coefficients of elasticity in the analysis. For example, in the analysis of the model built for the network of communication and information services to the population of the region, we calculated the coefficients of elasticity.

The multi-factor empirical model, designed to develop the field of health care (Y) to the population of the region, yielded the following results: the volume of health services provided to the population of the region (Y) will increase by 1.07% if the regional health expenditures (X1) increase by 1%, if the number of hospital beds per 10 thousand population in the region (X2) increases by 1%, Decreased by 1.94%, the number of doctors per 10 thousand population of the region (X3) increased by 1%, increased by 1.82% and the number of nurses per 10 thousand population of the region (X4) If it increases by 1 percent, it decreases by 8.55 percent.

In this regard, econometric modeling was forecasted to obtain the planning values of service areas in the region. When forecasting using empirical models, we achieved the following results: the consistency of priorities set out in the Presidential Decree "On the Action Strategy for the five priority areas of development of the Republic of Uzbekistan in 2017-2021" The analysis of the results of the forecasts obtained taking into account the empirical models built for the future development of the

service sector of the population of Kashkadarya region, as well as the reforms carried out in this area, shows the following:

Table 6. Forecast of medical services for the population of Kashkadarya region (billion soums / thousand soums)

Indicators	2021 (real)	Forecast years					
		2022	**2023**	**2024**	**2025**	**2026**	**2027**
SSx - Provision of health services to the population of the region Y8 / per capita	88,65	115,04	148,96	191,73	244,77	309,3	386,7
	95,88	114,57	136,06	160,68	188,76	220,7	256,8
	29,52	34,63	40,38	46,84	54,06	62,1	71,1
	23,86	30,51	39,46	51,52	67,81	89,8	119,4

The provision of health services to the population of the province (SSH) is expected to increase 1.19 times in 2020 compared to 2019, and 2.68 times by 2025. Access to pre-hospital medical examinations will be expanded, outpatient care will be provided, and pharmacy services will be improved. The level of hospital beds will increase, the number of doctors per 10,000 people will increase, and health facilities will be better equipped with the necessary equipment and facilities;

5.2 Conclusion

In conclusion, a separate econometric modeling of each sector of the health care sector is appropriate. Because the development of one service sector has a positive impact on the development of another. Therefore, the use of econometric models in the form of a system of interconnected equations is of particular importance in the development of service networks. In addition, the organizational-economic mechanism of development of service networks is a hierarchical system of interconnected elements and groups (subjects, objects, principles, forms, methods and tools) at different levels. expresses, in addition, their interactions, innovative infrastructure, forming relationships with market entities.

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