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## STATISTICAL ANALYSIS OF SERVICES PROVIDED IN THE HEALTH CARE SYSTEM IN UZBEKISTAN

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### ABSTRACT

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*This article will apply the issues of compiling national health accounts, its principles, stages, classification of financing and costs, the concept of reforming the health system, the principles of improving the main directions and the most important mechanisms, the International Statistical Classification of Diseases and Health Problems, which provides comparison and from the data of the World Health Organization (WHO), outlines the specifics of further improving the methodology of their statistical analysis.*

**KEY WORDS:** *macroeconomics , National Health Accounts, Health Statistics, International Statistical Classifier, World Health Organization, statistical reports of health organizations, retrospective studies, population morbidity statistics.*

### INTRODUCTION

The healthcare system occupies a special place among the achievements made in the socio-economic spheres during the years of independence of our republic. Currently, regulatory and legal frameworks are being created for carrying out extensive reforms in the health care system in our country. The development strategy of New Uzbekistan for 2022-2026 [1] also defines the tasks of wide attraction of foreign investments for the development of the sector. In particular, within the framework of "Attracting 14 billion US dollars worth of investment in energy, transport, healthcare, education, ecology, communal services, water management and other sectors based on public-private partnership" According to the legislation on public-private partnership in the field of weight management, the implementation of public-private partnership projects with a total amount of 275 million US dollars has been determined.

As a result of the large-scale measures being taken to fundamentally reform and further develop the

healthcare system in our country, another new direction in the tourism sector of our country's economy is leading to the formation of medical tourism. And it shows that the field of medicine in our country is developing further. As a practical example of our thoughts, the Decree of the President of the Republic of Uzbekistan dated January 28, 2022 on the development strategy of New Uzbekistan for the period of 2022-2026 "Development of the healthcare system, protection of public health and medical personnel tasks such as " implementation of comprehensive measures aimed at implementing the capacity building program in 2022-2023, as well as the strategy of digitalization of the healthcare sector for 2022-2026 " [1].

At the same time, in this strategy, in order to improve the quality of medical services provided to the population, to effectively use budget funds, to centralize medical services and to introduce the practice of medical insurance for the population, the organization of a centralized laboratory, sterilization and high-tech inspection system and tasks of the

gradual introduction of the population health insurance system have been defined. According to the 64th goal of the strategy called "Organization of primary medical service in the regions based on the principle of "one step", taking into account the existing needs of the regions and the suggestions of the population, in 2022-2023, 61 family polyclinics, 215 family doctor's offices will be established, in order to create more favorable conditions for the use of quality medical services, the tasks of taking the necessary measures for the organization of primary medical services in the neighborhoods, providing remote medical services to the population using modern information technologies, and expanding their capabilities have been defined. In order to effectively implement the above tasks, it is necessary to form a database of statistical information on the field and to adapt it to international standards, in the process of statistical analysis of the field and development of the necessary forecast indicators for the future periods.

At the same time, the Organization for Economic Cooperation and Development (IHRT). The System of Health Accounts ( SHST) is methodologically coordinated with the System of National Accounts (SNS) of 1993, based on concepts and accounting rules. SSHT provides communication of these accounts with other data of socio-economic statistics.

At the same time, institutionalization means that data and reporting methods will have a standard form, which allows for annual comparative analysis. In accordance with the creation of procedures (procedures) and protocols, it is necessary to systematize or improve the country's medical information system. In addition, it is recommended that the National Health Accounts ( NHAS) team manage the initial methodology and any issues that arise during the establishment of the NHS. Tracking these issues will provide a better understanding of how to modernize SSMH and increase their use in practice. In addition, this information allows to protect the SSMH from "memory loss" if the SSMH group loses its solving members. The process of formation of SSMH and standardization of information are important components of the process of institutionalization [ 2 ]. Therefore, the implementation of national accounts in the field of medicine creates a basis for international organizations to pay more attention to the health care system of our country and place investments with confidence in the coming periods.

## **ANALYSIS OF LITERATURE ON THE SUBJECT**

Among the scientists who conducted statistical research in the field of medicine, NV Potemkina stated that medical statistics as an element of the labor function is the most popular and in demand in practical

health care, therefore, the need to train specialists in medical statistics, including medical statisticians working in medical organizations, is urgent at the modern level [3 ].

Digitization of the healthcare sector is a key technological approach to establish efficient and rapid collaboration between citizens, doctors and managers in the healthcare sector. The creation, implementation and development of a unified information base in the field of medicine should lead to the integration of processes in the field of health care, starting from primary care and ending with its high-tech components [4 ].

Today, certain narrow areas of health care are increasingly developing, such as palliative care, medical rehabilitation, infectious disease service work, primary care, regional planning, and others. Timely formation of information and indicators is necessary in a short period of time in order to determine the strategic directions of development and quick corrections [5].

Medical information systems (TAT) were created to simplify the accounting and storage of medical data and create the possibility to create flexible analytical and statistical reports on these data. The development of the use of information technologies in medicine is related to the introduction of modern information systems in health care [6].

Estimating national health expenditure takes into account the transactions in the health system that connect the SSMH to the residents and citizens of the country, rather than the geographical boundaries of the country. For example, SSMH covers the costs of medical care for residents and citizens temporarily abroad, and covers the costs of medical care provided to foreign citizens in the country. Also, the costs of international organizations for medical aid, medical services and goods for the residents of the host country are also national health costs [7,8].

Countries that decide what data to choose, how to collect and evaluate it should rely on the following factors:

Transparency - The source of cost data, the types of classifications and descriptions used, and any adjustments or calculations should be clearly documented. Typically, this would require the writing of an SSMH assessment manual in each country.

Political Importance - health cost estimates should be made in such a way that all calculations relevant to the development of the country's health policy should be guaranteed.

Compliance with existing international standards and practices The health care cost estimation system must be consistent with international principles and standards . For example, public finance statistics with the system of national accounts [9,10]. All deviations from standards must be strictly documented.

In Switzerland, Germany, France, Iceland,

Serbia and Portugal, funds allocated to the medical sector make up 10-13% of GDP. In the world, the average relative weight of general budget expenditures on health is 6.3% of GDP, in Europe this indicator is 6.7%. According to the CIS Statistics Committee, this indicator was as follows in the countries of the Commonwealth of Independent States: 5 percent in Belarus and Moldova, 4 percent in Russia and Ukraine, 3 percent in Kyrgyzstan, 2 percent in Kazakhstan, and Armenia and 1 percent in Azerbaijan [11].

### RESEARCH METHODOLOGY

statistical tables and graphs in the research process of statistical analysis of the medical field and adaptation of statistical data to international standards , various statistical analysis methods such as induction and deduction, statistical grouping , expert assessment, scientific abstraction, analysis and synthesis, dynamic series and economic indices were widely used.

This research is the object of our work, and the system of statistical indicators of the medical field in our republic and the main directions of their adaptation to international standards have been selected.

The purpose of conducting our research is to statistically evaluate the impact of reforms in the healthcare system in our country and to develop the

$$m = \pm x \sqrt{\frac{P * q}{n}} \tag{1}$$

Here:

m - the average error of the indicator;

P - indicator;

q is the inverse quantity obtained according to the relative quantity;

n is the total number of observations.

It can be calculated as follows: if the indicator (P) is calculated in percent (%), then q = 100 - P; if the indicator (P) is in parts per million (‰), q = 1000 — P and so on.

As a result of the attention paid to the medical system in our country, very positive indicators have

necessary forecast indicators in order to use them in making strategic decisions for future periods and to use them in our country according to the level of statistical significance. is to determine the directions.

### ANALYSIS AND RESULTS

Statistical research makes it possible to assess the level of health of the population, the periods of increase and decrease of morbidity, the ratio of healthy people and disabled people, the efficiency of health care, the frequency of new diseases, etc. Medical statistics is a whole science, without which it is impossible to develop medicine, because statistics allow to predict and indicate problem areas where new methods and methods of solution should be sought.

Statistical data is formed based on the data obtained as a result of medical observations . In this process, the level of accuracy of the system of statistical indicators related to medicine is of great importance, and its measuring quantity is its error.

The error of the index indicates how much the quantity (relative or mean) obtained from the sampled population differs from the quantity that could be obtained from the total population. Thus, in order to determine the degree of accuracy of relative and average values obtained as a result of statistical research, their average errors are derived. The formula for calculating the average error of relative values:

been achieved. In particular, as a result of the radical reform of the healthcare system in the regions, the volume of services in the field has been growing for years.

From the picture above, we can see that the city of Tashkent (43.4 percent) took the first place with a very large share compared to the rest of the regions. In the field of medicine, almost half of the republic is located in Tashkent city, while Tashkent region (10.3%), Samarkand (7.5%) and Ferghana(7.3%) regions take the next places. it will be possible .

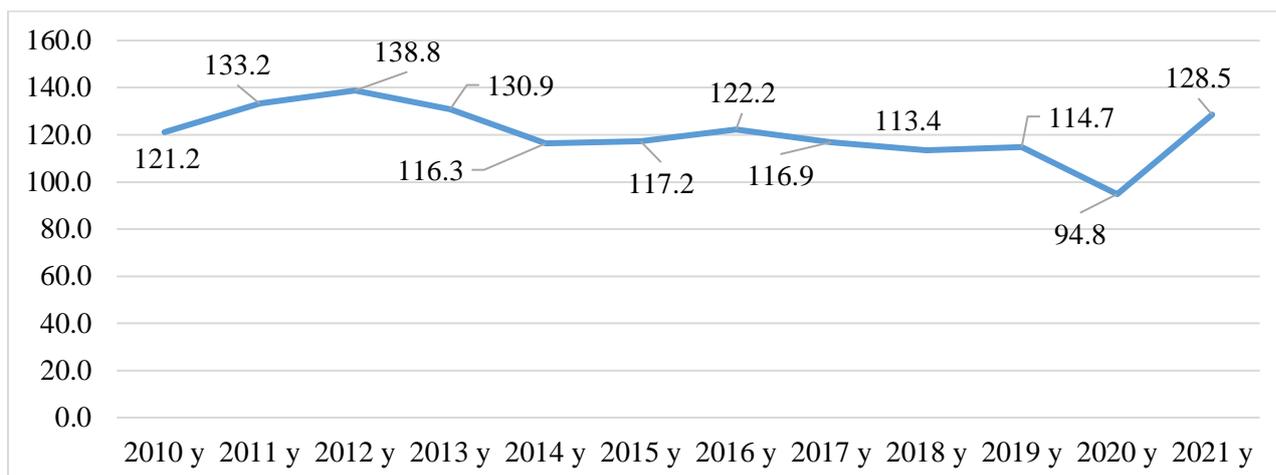


Figure 1<sup>1</sup>. The growth rate of health services, in percent

From the above figure, we can see that over the years, the growth dynamics of medical services have

recorded different growth rates, and we will be able to observe the growth dynamics in the last year 2021.

Table 1<sup>2</sup>  
Medicine services of size changes in the Republic of Uzbekistan

| T/r. | Year | Health storage of services growth rate, in % | Total services growth rate, in % | Health save total in services share, in % |
|------|------|--|----------------------------------|---|
| 1.   | 2010 | 121.2  | 115.8                            | 1.0                                       |
| 2.   | 2011 | 133.2  | 117.2                            | 1.0                                       |
| 3.   | 2012 | 138.8  | 114.7                            | 1.1                                       |
| 4.   | 2013 | 130.9  | 114.4                            | 1.2                                       |
| 5.   | 2014 | 116.3  | 114.2                            | 1.3                                       |
| 6.   | 2015 | 117.2  | 113.4                            | 1.4                                       |
| 7.   | 2016 | 122.2  | 114.7                            | 1.5                                       |
| 8.   | 2017 | 116.9  | 110.7                            | 1.4                                       |
| 9.   | 2018 | 113.4  | 108.9                            | 1.5                                       |
| 10.  | 2019 | 114.7  | 113.2                            | 1.6                                       |
| 11.  | 2020 | 94.8   | 103.0                            | 1.5                                       |
| 12.  | 2021 | 128.5  | 119.5                            | 1.8                                       |

Above from the table apparently as in our country health storage to the system serious attention focus as a result years during dynamics 2020 is an exception when doing, positive in case (from 121.2 percent in 2010 128.5 percent in 2021). Total services this in years o ' sib went health , though storage of services in it share years during positive to photos achieved ( 1.0 percent in 2010 1.8 percent of the share in 2021).

Normative legal documents adopted in our country in achieving these indicators is incomparable. Within the framework of reforming the health care system, certain works are being carried out on the formation of a modern system of providing primary medical and sanitary care, prevention and early detection of diseases, training of qualified medical personnel, introduction of new management in the field. At the same time, the most important directions of reforming the healthcare system at this stage are considered [13] :

<sup>1</sup> State statistics committee developed by the Author based on his information.

<sup>2</sup> State statistics committee developed by the Author based on his information .

First of all, comprehensive strengthening of primary medical and sanitary care, introduction of a completely new system of medical prevention and patronage system, formation of a healthy lifestyle and provision of public health of the population up to the level of neighborhoods and households to create a comprehensive system, in this regard, first of all, systematic organization and wide promotion of healthy lifestyle and increasing physical activity;

To create a competitive environment in the training, retraining and upgrading of the personnel with advanced and deep knowledge in the field, to form an effective system of professional development of employees based on advanced foreign experience, to increase the effectiveness, quality and popularity of local medical care through the development of medical science;

Implementation of specific practical measures to strengthen the role and status of medical workers in society, increase respect for them among our people, create decent working conditions and increase their income, as well as strengthen their social protection;

Introducing modern management in the field, reducing redundancies and bureaucratic procedures in the management process, improving the efficiency of the health care financing system, and improving digital medicine.

At the same time, increasing the quality, efficiency and popularity of medical care to the population, expanding the scope of primary medical and sanitary care, gradually introducing a medical insurance system into the field, creating a modern competitive environment in the market of medical services, on this basis In order to expand the opportunities to receive guaranteed and quality medical care, the President of the Republic of Uzbekistan dated November 12, 2020 "On measures to introduce a new model of the health care system and state medical insurance mechanisms in the Syrdarya region" Resolution No. PQ-4890 [14] accepted. According to him:

In primary medical and sanitary care institutions, groups consisting of a family doctor, his assistants in the areas of therapy and pediatrics consisting of secondary medical workers, patronage nurses and midwives are formed;

A state-guaranteed package of free medical services and medicines (hereinafter - the guaranteed package) is developed at the level of each medical institution;

At the same time, the Decree of the President of the Republic of Uzbekistan dated December 7, 2018 "On measures to organize the activities of the Ministry of Health of the Republic of Uzbekistan" was adopted regarding the fundamental reform of the health care system. - Decision No. 4055 defines the main tasks and areas of activity of the Ministry of Health of the

Republic of Uzbekistan and its regional bodies. According to him [15] :

A unified state policy in the field of health protection of citizens aimed at increasing the role and responsibility of the bodies and organizations of the Ministry in providing full and timely medical services to the population, including in the volumes guaranteed by the state implementation, all-round support for the development of the private sector in the health care system and the formation of healthy competition between state and non-state medical organizations;

Forecasting demographic changes and health care development prospects, comprehensive analysis of population health and morbidity;

In order to improve the gene pool of the nation, to create favorable conditions for the birth and upbringing of a healthy generation, to increase the medical culture in the family, to increase the quality and longevity of life, to protect the health of the population and to maintain sanitary-epidemiological peace development of directions;

Primary, quick, urgent and specialized medical care provided to the population at the expense of bringing medical care closer to the population served, wide introduction of information technologies, telemedicine, clinical protocols of treatment, and providing the experience of leading foreign and local specialists to the medical staff of regional medical organizations increase the level of convenience and speed, as well as increase the volume and quality of medical services provided by specialized medical centers in the regions;

Implementation of measures to regulate the circulation of drugs by the state, standardization and certification of drugs, medical products and medical equipment, as well as equipment allowed to be used in the territory of the Republic of Uzbekistan ;

Implementation of state policy in the field of medical personnel training and improvement of the regulatory legal framework by providing methodological leadership over medical educational institutions, post-secondary education and health professionals' qualification improvement and retraining;

Development and forecasting of a strategy for the development of medical science based on the combination of local experience and the best world achievements, increasing the effectiveness of scientific medical research, introducing scientific and technical achievements and advanced experience into health care practice, medical education and personnel qualification development of the improvement system;

Prevention, warning and detection of cases of illegal spending and looting of budget funds are defined .

Also, digitalization of the healthcare sector and the introduction of a single complex of information

systems, reducing redundant procedures in the management process, improving the quality of services to the population, ensuring the work efficiency of medical personnel, digital transformation programs adopted in this direction for effective implementation, the decision of the President of the Republic of Uzbekistan was adopted. It [15] stipulates that starting from January 1, 2024, all medical and pharmaceutical organizations in the republic, including pharmacies, will be connected to the Unified Platform in a mandatory manner.

Also, development of technical and economic parameters, concepts and other project and pre-project documents of projects implemented for the optimization, rationalization, standardization and automation of processes in the healthcare system and organizations, for the development of information systems in the healthcare sector and financed at the expense of international financial organizations. , introduction of policies and standards of information technology and communications in the field of medicine and pharmaceuticals, as well as implementation and monitoring of a single complex of information systems "Electronic health", as well as ensuring their integration with the information systems of other state bodies, health information systems being implemented in order to develop business process and IT-reengineering in the system and to implement international experience in this direction, to attract investors, business partners and outsourcing services in order to fulfill the tasks, to expand the scope of digitization of the medical field and the tasks of implementation of the single platform of the healthcare information system (hereinafter - the Single Platform), which includes software products, are defined.

The positive results of the tasks mentioned above will create a basis for further development of the medical system.

## CONCLUSIONS AND SUGGESTIONS

It is known that certain works are being carried out on the digitization of the healthcare system. As part of the activities carried out in this direction, a number of information systems were installed in relevant medical institutions, including "Electronic polyclinic", "TMEK", "Narcological dispensary", "Psychological dispensary", "Patient", "Imulation", "Khatlov", " Birth and Death", "PSR-Test System" and others have been launched. However, systems such as "Electronic order", "Telemedicine", "Medical equipment account", "Personnel resources", "Online training", "Medical insurance" and mobile applications are planned to be launched by 2025. and in 2022-2025, it is necessary to accelerate the implementation of the unified electronic medical card, electronic hospital, electronic prescription, laboratory

and radiology, and artificial intelligence-based systems.-

Health Statistics Population Health Studies; it is necessary to perform a statistical analysis on the basis of indicators such as the number, composition, natural movement (birth, death, natural reproduction), physical development, prevalence of various diseases among the population and their course, average life. Based on the study of the general morbidity and mortality indicators or the causes of certain diseases and deaths among certain groups of the population in connection with their lifestyle, external environment, socio-economic, historical conditions and the results of the conducted research. It is necessary to develop and implement specific scientifically based measures to further improve the health of the population.

Mathematical analysis method and the formulas used in it are used to determine the number of observations sufficient to conduct a statistical study, the level of reliability of the obtained results.

In medical and sanitary statistics, mathematical analysis methods are used in all studies where a selected set is used, and when it is required to express and statistically analyze the results of observations in relative and average values, and in all studies conducted in clinical and laboratory conditions (when they have a relatively small number of observations ) is appropriate to use

Taking into account the above, the following was developed as a proposal regarding the formation of statistical data and their analysis in the medical system of our country:

1. To properly plan health care, to properly organize the work of sanitary-epidemiology and treatment-prophylactic institutions, to study their activities, the quality and effectiveness of medical services provided to the population, the type and number of medical institutions, collecting data on the number of employees working in them, the number of beds in residential hospitals and comprehensively analyzing them.

2. Evaluating treatment and preventive measures used in the experiment, studying their effectiveness.

3. Planning, organizing and conducting scientific research works in clinical and laboratory conditions, evaluating the accuracy of the obtained results, determining the laws of various events and processes in the body of a healthy and sick person, evaluating the effectiveness of new treatment and prevention methods.

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