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EFFECTIVENESS OF THE INTRODUCTION OF COMPULSORY HEALTH INSURANCE IN THE HEALTHCARE SYSTEM OF THE REPUBLIC OF KAZAKHSTAN

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Abstract. *The relevance of the study is due to the fact that in the Republic of Kazakhstan there is not enough information regarding the system of compulsory health insurance. During the study, theoretical methods were used (literature analysis, generalization); interviewing (using the online platform); empirical (study of the experience of medical organizations, regulatory documentation); methods of mathematical statistics and graphical presentation of results. The authors of this study calculated the performance indicators of the health care system according to the performance indicators: the work of doctors and medical personnel in primary health care; organization of specialized and high-tech care for patients; work of medical and social programs. Medical workers were asked to anonymously evaluate working conditions, choosing one of the three parameters "good", "satisfactory", "poor". An anonymous survey was also conducted among patients who underwent preventive examinations in public medical institutions at the beginning of 2018 and 36 months later. They needed to evaluate their own health. Positive dynamics was noted in all aspects studied. In the course of the study, new questions and problems have arisen that need to be addressed*

Keywords: *healthcare institution, health protection system, compulsory medical insurance, public administration, medical reform*

Introduction

The effectiveness of healthcare is an important part of providing medical care to the population, especially with state-funded healthcare systems. The needs of the population for medical care will always be greater than the resources available to meet these needs. Limited resources must be used wisely to ensure the best possible results and avoid losses (Kerasidou 2019, p. 173). The World Health Organisation (WHO) suggests an average of the following five parameters to determine health effectiveness: 1) public health, 2) health equity, 3) responsiveness of the health system, 4) responsiveness distribution, 5) equitable financing and total health costs (Tandon et al. 2000, p. 7-9). The changing burden of disease in Kazakhstan, but also around the world, is currently the main "push factor" for focusing on the management and quality of medical care. In Kazakhstan, health trends are paying attention to non-communicable diseases (NCDs), and, in particular, the burden of premature mortality from cardiovascular diseases (CVD) is significant (Barbazza et al. 2019, p. 129-130; Svyatova et al. 2019, p. 321).

Since gaining independence, Kazakhstan has made serious efforts to reform the post-Soviet healthcare system. In the 2000s, two comprehensive reform programmes were developed: the National Health Reform and Development Programme for 2005-2010 and the State Health Development Programme for 2011-2015 of Salamatty, Kazakhstan (Kulzhanov and Rechel 2012, p. 130). The continued increase in health care costs raises concerns about the sustainability of health insurance systems. Demographic ageing is often associated with this, because old age often leads to a deterioration in health and, as a result, to an increase in seeking medical help. However, in many recent studies, ageing is considered as a secondary factor (Sninate and Bennana 2020, p. 95; Abdrasulov and Gubaidullin 2019, p. 1954). Healthcare systems are one of the main indicators of the country's development (Gerbut et al. 2020, p. 192). It is in the interests of each state to improve and preserve the general health of its citizens by providing them with appropriate medical care.

Financing, resources, and effective management of public health systems are identified as key components of the health system (Tandon et al. 2000, p. 5). Resources include human resources (doctors, nurses, dentists, therapists and other medical personnel), medical facilities, medical equipment (beds, devices and consumables), and medicines. Nevertheless, human resources are considered to be the main factor of every healthcare system and represent its largest and most important aspect that needs to be constantly developed (Tazhbenova et al. 2019; Spaska et al. 2021, p. 888). Accessibility, fair and efficient allocation of resources is a basic prerequisite for a successful health system.

Each country implements a health policy in accordance with its economic capabilities. Health systems often differ depending on their funding models. Health systems are usually funded according to one of these four basic models: 1) The Beveridge model. The main characteristics of this model are that the healthcare system is funded by taxes. Medical care is available to everyone, and most medical and preventive care facilities are state-owned; 2) The Bismarck model. In this model, the healthcare system is funded by compulsory health insurance paid for by both employees and employers. The model covers the entire population and is usually not profit-oriented; 3) National model of

health insurance. This type of healthcare has the characteristics of both Bismarck and Beveridge. Medical institutions are mostly privately owned, but services are paid for by the state based on insurance premiums paid by each resident. This model is not aimed at making a profit, and services are available to everyone, but the government reserves the right to determine which medical services are covered by the state; 4) The "out-of-pocket" model. It is most common in underdeveloped countries. According to this model, medical institutions are mostly private, expensive, and accessible only to wealthier people (Radojicic et al. 2019, p. 320-323; Zaborovskyy et al. 2020, p. 150).

According to the programme "100 concrete steps" (2015) for the implementation of five institutional reforms of the Head of State Nursultan Nazarbayev, it is necessary to introduce compulsory social health insurance. "Strengthening the financial stability of the healthcare system based on the principle of joint responsibility of the state, employers, and citizens. Priority financing of primary health care (PHC). Primary care will become the central link of national health care for the prevention and early control of diseases". The purpose of this study is to consider some aspects of the effectiveness of the introduction of the compulsory health insurance system in the healthcare system of the Republic of Kazakhstan. The study was conducted by specialists of the non-profit joint-stock company "Social Health Insurance Fund" on the premises of five medical institutions in the Republic of Kazakhstan.

Materials and Methods

In the course of the study, theoretical methods were used (literature analysis, generalisation); interviewing (using an online platform); empirical (investigating the experience of medical organisations, regulatory documentation); methods of mathematical statistics and graphical representation of results. The concept of "efficiency" implies the degree of achievement of specific results. The authors of this study calculated the performance indicators of the healthcare system according to the following indicators: 1) Work of doctors and medical personnel of primary health care; 2) Organisation of specialised and high-tech patient care; 3) Work of medical and social programmes.

When evaluating the work of doctors and medical personnel of primary health care, an analysis of diagnostic, therapeutic, preventive, and organisational work was carried out according to the following parameters: 1) The presence of defects in organisational work in the department, which were identified by the results of inspections of competent authorities, and the medical commission; 2) Justified complaints about the quality of medical care (including diagnostic prescriptions), and standards of medical activity according to the conclusion of the medical commission; 3) The coincidence of clinical and pathological diagnoses; 4) Compliance with the quality of medical care with the established requirements (compliance with the terms of examination of the patient, the volume and timeliness of diagnostic and therapeutic measures, compliance with the prescribed treatment with the diagnosis; compliance with the terms of referral and completeness of preparation of patients for psychiatric examination by the commission of psychiatrists and medical and social expertise, etc.); 5) Emergencies in the department,

including deaths from controlled causes; 6) Diagnostic defects based on the results of inspections by the medical commission, higher-level and supervisory authorities; 7) Timeliness and quality of interpretation of the results of diagnostic studies.

Each of the parameters, depending on the number of events, was evaluated on a scale from 0 to 5. A score of 5 implied the performance of doctors and medical staff in providing primary health care in a benchmark setting, while a score of 0 implied the highest possible number of irregularities in the performance of doctors and medical staff. In addition, healthcare workers were asked in an anonymous format to rate the working conditions by choosing one of three parameters "good", "satisfactory", and "bad". The survey was conducted twice – in 2018 and 36 months later. The analysis of the effectiveness of the organisation of specialised and high-tech care for patients was assessed on the waiting time for hip replacement. The operated patients in the hospital were asked to mark the waiting period for this intervention anonymously using an online platform. The survey was conducted twice on different groups of patients – in 2018 and 36 months later. A total of 28 people took part in the experiment.

The study of the effectiveness of medical and social programmes was conducted on the example of health schools. Patients with diseases of the cardiovascular system (arterial hypertension, coronary heart disease, arrhythmias) were asked to take an anonymous survey before and after completing the course at the health schools on an online platform. The survey consisted of 5 questions assessing the patient's knowledge about their disease and the necessary treatment. Then the points were calculated for each answer and the results were analysed. 136 patients took part in the survey. An anonymous survey was also conducted among patients undergoing preventive examinations in state medical institutions in early 2018 and 36 months later. They needed to assess their own health. 356 patients took part in the survey. The number of patients in different age groups is shown in Table 1. All the participants were aware of the nature of the study and gave their consent to the tests.

Table 1. **The number of patients in various age groups undergoing preventive examinations in state medical institutions at the beginning of 2018 and after 36 months**

Age category	Number of patients	
	2018	2021
18-25 years old	30	41
26-35 years old	35	40
36-50 years old	27	30
51-65 years old	40	42
Over 65 years	38	33
Total patients	170	186

Results and Discussion

The summary scores for primary care physicians and medical personnel of primary health care in points in 2018 and 2021 are presented in Table 2. Based on the data in the table, it can be concluded that there is a positive trend in general. There were no changes in parameter 1, however, there was 1 emergency in the department in 2021.

Table 2. **Performance assessment results of doctors and medical personnel of primary health care**

Parameter number	2018	2021
Parameter 1	3	3
Parameter 2	6	3
Parameter 3	6	3
Parameter 4	9	6
Parameter 5	0	1
Parameter 6	3	0
Total number of points	27	16

The results of the survey of employees of medical institutions are presented in Table 3. Based on the data obtained, it can be concluded that in all groups of employees, the percentage of people who indicated working conditions as "good" has increased. Human resources are the most important component of the health system, and countries should pay special attention to the development and recruitment of competent health workers. Reorganising human resources and the funds allocated to them can also improve efficiency (Radojicic et al. 2019, p. 325; Zasorin et al. 2012, p. 18).

The authors of another study (Sturm et al. 2019, p. 10-11) conducted a written survey of all doctors and nurses in the inpatient departments of a German university hospital. The questionnaire was a combination of the Copenhagen Psychosocial Questionnaire (COPSOQ), the Copenhagen Burnout Questionnaire Scale (CBI) for assessing patient-related burnout, and individual parts of the Hospital Patient Safety Culture Survey (HSPSC). Indicators from administrative data used to assess workload and patient-related workload included: the number of overtime hours worked, accounting for the intensity of nurses' work, cost weight, employment rate, and length of hospital stay. The quality of care was assessed using indicators of repeated hospitalisation and the length of hospital stay associated with the disease. One-dimensional associations were tested using Pearson correlations. It was concluded that the perception of hospital staff regarding suboptimal workplace safety and problems of teamwork correlates with the worst outcome indicators for patients. In addition, objective indicators of overtime work, and objective indicators of workload, clearly correlated with subjective factors of stress and tension associated with work. This suggests that objective indicators of workload (for example, overtime)

can be used to indirectly monitor the work-related psychological burden on employees and, thus, improve not only the well-being of staff, but also the results of patient treatment (Yermukhanova et al. 2019, p. 233; Stepanov et al. 2015, p. 229-230). On the other hand, by listening to the opinion of their staff, hospitals can improve the safety of patients (and employees).

In studies related to psychosocial working conditions, the main factors of doctors' workload were haste, lack of good communication within the team. Although symptoms of mental disorders and sleep disorders are common among doctors, the latter are less likely to retire due to disability, for example, due to depression, than representatives of other professions. Among municipal professions, doctors have almost the lowest rate of absenteeism due to illness. The problems caused by changes in the work of a doctor can be solved with the help of fair management, the development of the social capital of the working community, the organisation of tasks and the flexibility of working hours (Elovainio et al. 2017, p. 650).

Table 3. **Assessment of working conditions by employees of medical institutions**

Employee's position	% of respondents who rated working conditions as					
	2018			2021		
	good	satisfactory	bad	good	satisfactory	bad
Head of the department	50	0	0	100	0	0
Doctor	60	20	20	65	20	15
Middle medical personnel	55	11	44	70	16	14
Junior medical staff	40	42	18	52	30	18
Accounting staff and other employees	80	20	0	82	18	0

The role of health schools and patient education was discussed. Originally developed to improve the treatment of serious chronic diseases such as diabetes mellitus, obesity, cardiovascular diseases, asthma, and as a follow-up after cancer treatment, therapeutic patient education has been extended to other situations, including chronic dermatoses such as atopic dermatitis, eczema, and psoriasis (Guerrero and Calmette 2020, p. 56; Kosherbayeva et al. 2018, p. 241; Salimova et al. 2005, p. 796). Patient education is an important component of quality patient care and offers many potential benefits. Healthcare providers are responsible for ensuring that patients receive the education they want and need to improve their health and make medical decisions (Leep Hunderfund and Bartleson 2010, p. 523; Buletsa et al. 2019, p. 430; Neumann-Podczaska et al. 2019; Korniichuk et al. 2021, p. 181).

Therapeutic training of patients who suffer from cardiovascular diseases is an important part of risk factor management. It should be continued throughout the disease. Creating a healthcare network focused on patient literacy promotes healthier

lifestyle habits and improves the management of care for these patients (Racodon and Porrovecchio 2019, p. 19-20; Hromovchuk 2018, p. 47; Skak et al. 2016, p. 3099). Subjects from the current study also demonstrated increased awareness of their disease after taking a course in health schools.

The link between health literacy and achieving health outcomes includes access to and use of health services, patient-provider interaction, and self-help. Digital approaches can be developed to simplify or expand the concept, test for understanding and have no time constraints. New technologies, such as artificial intelligence and machine learning, virtual and augmented reality, and blockchain can take the role of technology beyond data collection into a more integrated system (Tanirbergenova et al. 2021, p. 243). Digital solutions enable a person to be an active participant in the treatment process. These technologies can be provided in such a way as to strengthen a person's confidence that the treatment plan will be successful and the patient will be able to adhere to it. Digital solutions allow multimedia education in several languages, using formal and informal teaching methods. While a clear definition of health literacy and a learning model are important, further research is needed to continually identify more effective ways to incorporate medical technology into the process of improving health outcomes (Conard 2019, p. 280-282; Bielov et al. 2021, p. 2665; Sharova et al. 2021).

The problem of patient education by medical staff was also considered in the article of the year. In the context of an ageing population, strengthening the health of elderly patients has become an urgent public health problem. Health education and health literacy should be further understood from the standpoint of health care providers to increase the effectiveness of the use of such information by elderly patients in their daily lives. The authors of the above study sought to better understand the nurses' opinion regarding the education of elderly patients and their health literacy, since nurses are among the first physicians interacting with elderly patients. In total, 16 nurses with 5 or more years of clinical experience participated in the survey. The data was collected through personal interviews and emails. The survey results illustrate the conditions related to communication with the elderly from the standpoint of patients, health care providers, and the provision of medical care. Systemic care and interventions specialised for elderly patients and their healthcare professionals should be developed and tested to improve clinical practice and patient health literacy.

As a result of a survey to assess the effectiveness of the organisation of specialised and high-tech care, the average waiting time for hip replacement in 2018 was 6.3 months, in 2021 – 6.2 months. The shortest waiting period in 2018 was 3 months, in 2021 – 4 months, the maximum waiting period was 9 and 12 months, respectively. Another prospective cohort study involving 153 patients from New Zealand (Fielden et al. 2005, p. 995-996) was aimed at determining the economic and health costs in anticipation of total hip replacement. The quality of life related to health was assessed monthly using the WOMAC and EQ-5D questionnaires, filled out independently, from the moment of registration before surgery and up to 6 months after surgery. Monthly cost diaries were used. The average waiting time was 5.1 months, and the average total cost of waiting for surgery was NZD 4.305 (USD 2.876) per person. Waiting more than 6 months was associated with a

higher overall average cost (NZD 4.278 /USD 2.858 per person) than waiting less than 6 months (NZD 2.828/USD 1.889 per person; P<0.01). Improvements were found on the WOMAC and EQ-5D scale from preoperative to postoperative (P< or = 0.01). A longer wait led to a deterioration of physical functions before surgery (P< or = 0.01). Patients with poor baseline health showed greater improvement in WOMAC (P = 0.0001) and EQ-5D (P = 0.003) 6 months after surgery. A longer wait for a complete hip replacement entails greater economic costs and deterioration of physical functions during the wait. Health systems throughout the Western world are struggling to cope with the burden of an ageing population. The cost of waiting for an operation suggests that waiting for 6 months or more is expensive for New Zealand society. This should be remembered by healthcare planners.

However, the authors of another study (Chakravarty et al. 2005, p. 270) note that government reformers often give priority to patients depending on the time spent on the waiting list. This may contradict the surgeon's priorities based on clinical needs. The authors of the above-mentioned study surveyed 125 consecutive patients who were waiting for a complete hip replacement on the waiting list for surgery by one consultant. The authors also assessed the pain and limb function using a modified Harris Hip Score, which was calculated during the addition to the surgical waiting list, during preoperative evaluation, and after 6 months of follow-up. The analysis showed that although the condition of many patients (31.2%) worsens in the waiting list for surgery, not all do it. Some clinically remain the same (53.8%), and some improve (15%) while waiting for surgery. The authors concluded that patients should not be given preference solely to the length of time they spent on the surgical waiting list. Waiting lists should be constantly reviewed.

Positive dynamics was also observed when the population assessed their health. On average, the percentage of those who noted their state of health as "good" increased in each age group. The assessment of their health in each of the groups is shown in Table 4.

Table 4. **Assessment by the population of the state of their own health**

Age category	% of respondents who rated their own health as					
	2018			2021		
	good	satisfactory	bad	good	satisfactory	bad
18-25 years old	90	9	1	92	7	1
26-35 years old	88	10	2	90	7	1
36-50 years old	85	11	4	85	11	4
51-65 years old	50	15	35	52	17	31
Over 65 years	20	35	45	25	35	40

The healthcare system is undergoing changes throughout the entire post-Soviet space. Thus, since January 1, 2018, a new medical reform has begun in Ukraine, new draft laws have been developed and amendments have been made to the current legislation. The

legislator began to gradually abandon the organisational and legal ways to improve the functioning of medical institutions to develop the market of medical services, and to ensure the protection of patients' rights. The main issue of healthcare reform was the improvement of public administration, in particular, the creation of new mechanisms for financing medical institutions. The purpose of the study by Ukrainian researchers (Knysh et al. 2019, p. 888-889) was to conduct a theoretical investigation of the peculiarities of public administration in the field of healthcare in Ukraine and to substantiate practical recommendations for its improvement considering the processes of European integration. The study used methods of analysis and synthesis, and a comparative legal method. The analysis of the current legislation and the world experience of reforming the medical industry allowed identifying the problematic issues of this publication, and to formulate the author's opinion on the way to improve public administration through the healthcare system in the context of reforming medical care. The authors considered the areas of modernisation of public administration of the healthcare system in the context of medical reform in Ukraine. Conclusions were drawn that the management reform by its nature does not pay sufficient attention to ensuring the medical rights of citizens, as evidenced by the provisions of legislation regulating access to patient data. The improvement of public administration in the healthcare sector is possible through the involvement of a group of international experts from EU member states to determine the optimal mechanism for the transition to a system of compulsory public health insurance.

An important point is that the current study observed positive dynamics in every aspect of investigating the effectiveness of the introduction of the compulsory health insurance system, despite the COVID-19 pandemic. Infectious diseases with pandemic potential pose a serious threat to the health and well-being of the population. Despite the fact that international health regulations provide the basis for legal obligations for pandemic prevention, preparedness, and response, many countries do not comply with these rules. An updated framework for global collective action is needed that ensures compliance with international standards and promotes effective prevention of pandemic infectious diseases and response measures (Duff et al. 2021, p. 431-432; Zaborovskyy et al. 2021, p. 155).

Studies have shown that an increase in the volume of primary health care in countries leads to an improvement in all parameters used to measure the effectiveness of medical care. Reducing financial barriers to access to health services is considered one of the most important mechanisms by which the health of the whole population can be improved. The ageing of the population contributes to an increase in the consumption of medical services, but there are other factors that significantly affect expenditure growth (Sninate and Bennana 2020, p. 102). There is more and more information in the scientific literature about the positive impact of health insurance on the health of the population. Thus, in the study by Chinese researchers, it was noted that medical insurance for pregnant women can significantly and directly improve the health indicators of infants (Tang et al. 2019, p. 13; Aringazina et al. 2020, p. 420). Thus, information is accumulating on the positive aspects of the introduction of the compulsory health insurance system in various countries.

Conclusions

1. This study evaluated the effectiveness of the introduction of the compulsory health insurance system into the healthcare system of the Republic of Kazakhstan. Positive dynamics was noted in all the studied aspects. In the Republic of Kazakhstan, compulsory health insurance is a politically and socially strategic programme for the country. It is a fundamental element in the development of national solidarity and equal access of the entire population of the country to medical care. The obligation of the state in this type of medical care is to ensure access to it for all social strata of the population by sharing health care costs, ensuring the provision of high-quality medical care evenly distributed on the territory of the Republic of Kazakhstan.
2. In the course of the study, new questions and problems arose that need to be solved. It is necessary to continue working to answer the following important questions for healthcare: 1) About the most cost-effective financing of the healthcare system for the state and citizens; 2) About protecting people from the financial consequences of diseases and paying for medical services in the future within the framework of the compulsory health insurance system; 3) About the conditions that contribute to the optimal use of resources.
3. The task of the future will be to diversify the resource base for financing the healthcare system and, thus, to ensure sustainability in the long term while maintaining the provision of services and the quality of medical care. Considering the changing demographic characteristics and the structure of morbidity, further tasks include the restructuring of financing and the provision of long-term care, improving the efficiency of the health system through the reform of procurement systems and payment to service providers. The availability of medical services and the experience of providing medical care are important factors in the development of public health policy. The effectiveness of healthcare in the Republic of Kazakhstan cannot be determined unambiguously. It is necessary to formally investigate the role of health policy and structures in determining its effectiveness. It is necessary to find the most cost-effective way to use resources, including human potential, capital, and equipment, to achieve certain results, such as the number of patients treated and waiting time (intermediate results) or saved lives and years of life (final results).

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