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MODIFICATION STABILITY OF HEALTH CARE FINANCING SYSTEMS IN CONDITIONS OF GEOECONOMIC INSTABILITY: A SITUATION ANALYSIS OF PANDEMIC CRISIS EXPERIENCE IN EU AND UKRAINE

ABSTRACT

The global experience of health care financing systems, acquired as a result of the geoeconomic pandemic crisis of 2020-2022, requires a deep systemic retrospective study.

It is substantiated that the SARS-CoV-2 coronavirus pandemic showed the weakness of the healthcare systems of the EU and Ukraine. However, it is advisable to consider it as a powerful multisystem trigger and catalyst for the transformation of healthcare systems, the maximum impact of which is predicted in the financial and logistics sectors, which are considered the weakest link of local healthcare systems.

It was determined that during the period of geo-economic pandemic instability, a fundamental difference in ensuring the functioning of healthcare systems was clearly outlined. The need for a constructive redistribution of limited financial resources to combat the pandemic was combined with a global shortage of unique specialized resources.

In the process of analysis, the economic, epidemiological, and social effectiveness of the use of the Government Stringency Index (GSI), the Containment and Health Index (CHI) and Global Health Security Index (GHS) are emphasized.

The study confirmed that during the period of geo-economic instability in the EU, the concept of global collective responsibility and increasing the sustainability of the health care financing system was conceptualized within the scope of the European Health Emergency Preparedness and Response Authority (HERA); EU4Health programs; single digital European health data space.

The authors to introduce the concept of modification stability of health care financing systems, which is understood as process of transformation of the health care financing system, which make it possible to overcome unforeseeable variations of external and internal influences not with the aim of preventing their relapse, but with the prospect of stable recovery and self-improvement.

Keywords: geo-economic instability, health care system, financing, stability, the COVID-19 pandemic, index, GSI, CHI, GHS

JEL Classification: F30, G28, I18

INTRODUCTION

Healthcare financing obviously is one of the main factors affecting the country's ability to cope with the health crisis caused by the SARS-CoV-2 coronavirus pandemic (hereinafter, the COVID-19 pandemic). It is important to analyze how healthcare systems have responded to the COVID-19 pandemic for planning and creating successful options for responding to future economic crises of biological origin. Regional, national and international experience in this field can be directly translated into solutions to help cope with the long-term impact of pandemics on health systems.

LITERATURE REVIEW

The issue of the stability of healthcare financing systems in the period of pandemic geo-economic instability arouses lively scientific interest among scientists.

Scientist Stepanova, O. considers the modern healthcare financing systems of all countries of the world vulnerable and unprepared to effectively respond to the COVID-19 pandemic. In her opinion, the conceptual basis of the health care financing paradigm in the pandemic and post-pandemic period is «the need to increase the role of state financing of health care costs, as well as the priority of budgetary resources in financing medical care over insurance» [1].

Parubchak, I. and Sirenko, R. propose to increase the level of funding of public health care due to in the future costs will increase not only for vaccines against COVID-19, but also for «treatment of patients with complications due to limited availability of medical services» [2].

Cherny, O. notes the uneven distribution and lack of motivated medical personnel is the main problem in the healthcare sector during the «corona-crisis» period. Therefore, in his opinion, there is a «need for coordinated and stable investments in health care» in creating decent working conditions and providing medical institutions with the necessary equipment [3].

A group of scientists Lekhan, V., Naduty, K. & Tolstanov, O. emphasize the fact that there is a problem due to the combination of "centralization of budgetary resources with decentralization of responsibility for network formation and response to the COVID-19 epidemic." Scientists consider the health care system will be resistant to the challenges actualized by the COVID-19 epidemic in the case of «defragmentation» and holistic conceptual design, forecasting, modeling, and strategic planning» [4].

The authors Gabor, V., Marushchak, M., Gabor, G., Krynytska, I. note it is impossible to meet the needs of health care during the spread of the pandemic within the framework of budgetary allocations, so many countries «attracted urgent financing from domestic and international sources, including emergency financing from the IMF and other international organizations» [5].

Talopov, I. draws attention to such a problematic aspect as the improvement of accounting and analytical support (the efficiency of receiving statistical data and their automation), which will reduce the risks of information manipulation making managerial decisions in the field of health care [6]. The authors Oneshko, S., Kustovska, O., and others propose to speed up the introduction of digital economy technologies in the field of health care [7].

Parubchak I. and Radukh N. suggest attracting new sources of financing with the help of medical insurance [8]. Although, according to some scientists, the COVID-19 pandemic has revealed significant flaws in the healthcare financing policy, especially in countries with social health insurance systems [9]. To enhance sustainability, these countries need to reduce cyclicity in coverage and revenue generation policies; increase state spending on health care; and also ensure the use of resources to achieve the goals of equality and efficiency [9].

The further expansion of the social functions of the state after the pandemic is evidenced Busemeyer's research, which showed that citizens are ready to pay additional costs for health care due to increased taxes or an increase in public debt [10].

Heshmati et al. identify problems with the identification, isolation, and treatment of patients among the main problems that the COVID-19 pandemic has caused in health care; overloading of medical and clinical staff and resources; intensive use of health care resources [11].

Rawaf Salman and his scientific colleagues point to the need for better communication between primary and secondary care. Especially, primary medical care, in their opinion, needs resources, sufficient equipment, training, and funding [12].

This aspect is also developed by Fitzpatrick et al., who in their article note the importance and main directions of primary care services during the COVID-19 pandemic: (1) development of communication and educational materials on vaccination, infection prevention, and safety; (2) approaches to infection prevention and public health promotion; (3) strengthening intergovernmental and interagency cooperation; (4) ensuring continuity of care, etc. [13].

A group of expert authors of the scientific work "Financing common goods for health" developed a conceptual approach to the concept of "common goods for health care" as a public product that has a significant social external effect in society. Therefore, to create more financially sustainable healthcare systems, they suggest prioritizing and coordinating actions and commitments at all levels of healthcare systems: global, national, regional, and local [14].

Foreign scientists Sagan et al. in their study identified 20 key strategies that can increase the resilience of healthcare systems during the pandemic. These strategies relate to the fair distribution and redistribution of funding; ensuring the need for medical workers; increasing supply capacity and care pathways for both COVID-19 and other patients. Nevertheless, the management strategy, in their opinion, is the basis and main lever of the functioning and sustainability of the healthcare system [15]. Approaches to the assessment of health care financing systems in countries and clear recommendations on priority areas of policy and its implementation in order to achieve sustainability of health care systems were proposed by researchers Jowett et al. [16].

AIMS AND OBJECTIVES

In the presented study, the authors aim to analyze the crisis experience of the healthcare systems of the EU countries and Ukraine during the SARS-CoV-2 coronavirus pandemic; formulate the essence of the concept of "modification stability of healthcare financing systems in conditions of geo-economic instability"; to prove that the specific biological factor of the SARS-CoV-2 coronavirus acted as a trigger and catalyst for deep structural processes that led to a change in the mentality and paradigm of financial provision of health care systems.

METHODS

In order to objectively reflect the pragmatics and issues of sustainability of health care financing systems in conditions of geo-economic instability, the article uses a dialectical-systemic approach and general scientific methods of research at various levels. To analyze the pandemic crisis experience of the EU and Ukraine, on the basis of which the concept of "modification stability of health care financing systems in conditions of geo-economic instability" was proposed, the method of situational analysis (Case study) was used.

In our research, we used a number of online databases:

Oxford COVID-19 Government Response Tracker; COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University; Our World in Data Coronavirus pandemic (COVID-19); Global Health Security Index.

Statistical data on the United Kingdom of Great Britain and Northern Ireland (hereinafter the United Kingdom), depending on the time range, are presented as part of the EU or as a separate statistical unit.

We believe that in order to ensure scientific objectivity and statistical reliability, the analysis of the pandemic crisis experience of Ukraine should be limited to the time frame of 2020-2021 since with the beginning of the Russian invasion of Ukraine in 2022, it is impossible to separate the impact on the health care system of military and biological factors that in combination have a synergistic disorganizing effect.

RESULTS

EU healthcare financing systems underwent a series of inertial logistical modernizations in the pre-pandemic period. However, they did not undergo a radical evolutionary transformation. By the latter, we understand a clear vector to social integration, which, a priori, requires significant time and financial resources. In the next 10-15 years, the EU member states did not foresee a deeper integration and unification of health care systems [17], focusing exclusively on non-communicable diseases, which dominated the causes of mortality in recent decades. Paradoxically, because WHO experts warned that urbanization and globalization processes have reached such a level that in the future the greatest threat to society will be infectious (primarily viral) diseases and new, dangerous infections of natural and unnatural origin [4].

The COVID-19 pandemic revealed the weakness of the EU member states, their inability to adequately respond to infectious threats, and the lack of interstate coordination in the field of health care. This stimulated governments to seek additional (non-budgetary) funding and attract domestic and international sources, including emergency funding from the IMF and other international institutions and organizations [18].

The pandemic has provoked a wide range of reactions from the governments of countries.

The first of these was increased funding and quarantine restrictions, which are standard measures to fight epidemics and public health protection tools. It is important to note that the degree of quarantine restrictions directly affects the availability of quality public services, including medical care. We are talking about the concept of universal health coverage

generally accepted in the EU - both physical (accessibility) and financial (affordability). It provides, firstly, that quarantine restrictions should not impair a specific person's access to medical services during this period (prevention, treatment, rehabilitation, and palliative care). Secondly, receiving such medical assistance, a person should not experience financial difficulties.

When the government introduced quarantine restrictions, became acute the issue of balance between containing the pandemic and maintaining the availability of medical services. That is, such preventive measures should prevail, which are effective in fighting the epidemic, but do not massively restrict rights.

In this regard, we consider the Government Stringency Index (GSI) and the Containment and Health Index (CHI) are worthy of attention. These indices are calculated, respectively, on the basis of nine and thirteen indicators, including testing policy; degree of contact tracing; wearing protective masks; vaccination coverage of the population; closing schools; closure of workplaces; cancellation of mass events; restrictions on public gatherings; closure of public transport; requirements for staying at home; public information campaigns; restriction of internal movement of persons; control of international trips. The indices range from 0 to 100.

It is important to note that these indices record not only the variations of the government's pandemic policy but also the priority of certain areas of it. However, the indices do not show a correlation between government actions and their effectiveness (economic, social, epidemiological). Each EU country has acquired its own unique and variable experience of pandemic changes in the health care system. Accordingly, the adequacy of the set of anti-pandemic measures and their impact on the healthcare system can only be assessed using a retrospective approach.

Analysis of the dynamics of changes in the Containment and Health Index in 2020-2022 shows that the maximum values of CHI indicators are in a wide range from 7.14 to 85.42 points. Even the peak values of CHI during the periods of the greatest epidemic burden in 7 European countries reached only 63.56 - 85.42 points out of 100 possible (Table 1). That is, the studied countries had unused reserve opportunities for adaptive changes in the healthcare system during the pandemic.

Table 1. Dynamics of the maximum selected values of Containment and Health Index in 2020-2022. (Source: created by authors on the basis of [19])

Country	Type	2020				2021				2022			
		January	April	July	October	January	April	July	October	January	April	July	October
Italian Republic	Containment and Health Index	22.2	85.42	73.51	71.13	78.75	84.11	80.71	66.06	68.36	55.61	40.11	43.90
	Absolute change of CHI indicator	-	+63.22	-11.91	-2.38	+7.62	+5.36	-3.4	-14.65	+2.3	-12.75	-15.5	+3.79
	Relative change of CHI indicator	-	+284.8%	-13.94%	-3.24%	+10.71%	+6.81%	-4.04%	-18.15%	+3.48%	-18.65%	-27.87%	+9.45%
Kingdom of Spain	Containment and Health Index	16.67	65.48	57.44	59.23	71.31	65.36	54.46	53.87	50.99	49.12	39.16	30.36
	Absolute change of CHI indicator	-	+48.81	-8.04	+1.79	+12.08	-5.95	-10.90	-0.59	-2.88	-1.87	-9.96	-8.80
	Relative change of CHI indicator	-	+292.8%	-12.28%	+3.12%	+20.39%	-8.34%	-16.68%	-1.08%	-5.35%	-3.67%	-20.28%	-22.47%
Republic of Austria	Containment and Health Index	0.00	72.62	44.64	67.26	77.26	81.67	62.54	61.96	63.43	58.33	54.76	56.76
	Absolute change of CHI indicator	-	+72.62	-27.98	+22.62	+10.00	+4.41	-19.13	-0.58	+1.47	-5.10	-3.57	+2.00
	Relative change of CHI indicator	-	-	-38.53%	+50.67%	+14.87%	+5.71%	-23.42%	-0.92%	+2.37%	-8.04%	-6.12%	+3.65%
Federal Republic of Germany	Containment and Health Index	7.14	70.83	58.04	60.42	73.69	71.55	73.21	53.57	60.13	53.57	39.64	40.24
	Absolute change of CHI indicator	-	+63.69	-12.79	+2.38	+13.27	-2.14	+1.66	-19.64	+6.56	-6.56	-13.93	+0.60
	Relative change of CHI indicator	-	+892.0%	-18.06%	+4.10%	+21.96%	-2.90%	+2.32%	-26.83%	+12.25%	-10.91%	-26.00%	+1.51%
United Kingdom	Containment and Health Index	41.88	61.61	65.48	62.20	81.67	62.56	51.79	51.57	49.36	36.61	21.13	16.67
	Absolute change of CHI indicator	-	+19.73	+3.87	-3.28	+19.47	-19.11	-10.77	-0.22	-2.21	-12.75	-15.48	-4.46
	Relative change of CHI indicator	-	+47.11%	+6.28%	-5.01%	+31.30%	-23.40%	-17.21%	-0.42%	-4.29%	-25.83%	-42.58%	-21.11%
Kingdom of Sweden	Containment and Health Index	0.00	54.76	57.14	51.19	63.56	60.67	42.75	26.88	46.17	19.05	19.05	11.90
	Absolute change of CHI indicator	-	+54.76	+2.38	-5.95	+12.37	-2.89	-17.92	-15.87	+19.29	-27.12	0	-7.15
	Relative change of CHI indicator	-	-	+4.35%	-10.41%	+24.16%	-4.55%	-29.54%	-37.12%	+71.76%	-58.74%	0%	-37.53%
Ukraine	Containment and Health Index	0.00	73.21	54.46	66.96	63.69	70.42	54.52	59.29	64.29	62.73	65.21	62.73
	Absolute change of CHI indicator	-	+73.21	-18.75	+12.50	-3.27	+6.73	-15.90	+4.77	+5.00	-1.56	+2.48	-2.48
	Relative change of CHI indicator	-	-	-25.61%	+22.95%	-4.88%	+10.57%	-22.58%	+8.75%	+8.43%	-2.43	+3.95%	-3.80%

The functioning of the health care systems of the EU countries and Ukraine in conditions of geo-economic stability demonstrates a direct relationship between the share of GDP aimed at financing the industry and the available resources (material,

professional, etc.). In the period of geo-economic pandemic instability, a fundamental difference regarding ensuring the functioning of healthcare systems was clearly outlined. After the successful operational mobilization and redistribution of funds for the purpose of countering the manifestations of the pandemic, there was no lack of financial resources.

However, there was a maddening global shortage of unique specialized and human resources (medical personnel, protective masks, respirators, ventilators, vaccines, etc.). For the first time, healthcare systems faced the problem that the availability of financial capacity did not guarantee the availability of the necessary resources and did not protect against the collapse of healthcare.

During the period of geo-economic instability, the concept of global collective responsibility in the EU was conceptualized. The vector strategy for the development of healthcare systems in the conditions of the pandemic was modified. Limited financial resources underwent a constructive redistribution with a priority on affordable testing and mass vaccination, i.e. prevention of morbidity and mortality.

The infrastructural deficit of hospital bases with a powerful volume of oxygen support and medical personnel, having reached critical indicators, transformed into a logistical collapse and a peak financial burden on the EU health care systems. The prioritization of treatment for patients with COVID-19 de facto led to a sharp decrease in the availability of medical care for non-communicable diseases. This has predictably caused an increase in complications, disability rates, and mortality from so-called preventable causes. We consider the last factor is the most threatening in terms of the long-term financial and social burden on the EU healthcare systems in the coming decades.

We consider the Global Health Security Index (GHS) to be indicative for verifying the development potential of EU healthcare systems. It was developed by the Nuclear Threat Initiative, the Hopkins Center for Health Security, and Economist Impact. The index measures the capabilities of 195 countries to prevent, detect and respond to biological threats, as well as political and socio-economic risks, health system strength, and country compliance with global norms and funding commitments.

The COVID-19 pandemic has shown that some of the countries with the highest GHS indicators did not promptly use all available capabilities, and therefore experienced the maximum burden of morbidity caused by the SARS-CoV-2 coronavirus.

The latest version of the GHS index, published in December 2021, consists of 171 questions grouped under 37 indicators in six categories (prevention; detection and reporting; rapid response; health system; commitments to improve national capacity, financing and global norms; risk environment). Each category is rated on a scale of 0 to 100, with 100 representing the most favorable health safety conditions and 0 representing the least favorable conditions.

A comparative analysis of the Global Health Security Index database for 2019 and 2021 shows that Republic of Finland has the highest score of 70.9 points among EU countries. Unfortunately, it is among 19 other countries that have worsened their index in the specified time period. The United Kingdom scored 67.2 points in GHS 2021 and, accordingly, worsened its performance by 1.1 points compared to GHS 2019. Only 7 of the EU countries achieved some improvement in GHS. The greatest progress +4.6 points was experienced by Republic of Lithuania, receiving an indicator of 59.5 according to GHS 2021 [20; 21]. We consider it expedient to analyze the experience of this country.

Republic of Lithuania has successfully implemented a detailed plan to manage the risks of the COVID-19 pandemic, changed the strategy of patient isolation. In accordance with the existing demand for medical workers of a certain specialization, the national procedure for training healthcare personnel was adapted. The policy was updated to increase the number of citizens who have access to the Internet through mobile phones or computers. Such initiatives led to an increase in the capabilities of the health care system not only at the outpatient level, but also at the hospital level.

We believe that it is inappropriate to use the GHS index in isolation to predict a country's ability to respond to biological threats. The GHS index cannot predict how effectively available resources will be used in the event of a crisis. However, it clearly indicates what elements need to be created, put in place or strengthened to ensure that the healthcare system is ready to respond to future biological threats. That is, it provides an opportunity to visualize the main vectors of the development of the healthcare sector.

The vector of GHS 2021 at the country level is setting a priority in national budgets for building and maintaining healthcare capacity, and providing funding for the National Health Security Action Plan. At the level of international organizations, the results of the GHS 2021 index help identify countries that could benefit most from additional support. The private sector will be able to use GHS 2021 to identify priority areas in partnership with governments. Analysis of the index at the level of charities and investors will help to create new funding mechanisms to provide the right direction for investments.

The main messages of GHS analytical reports for the period 2019-2021 can be formulated as follows:

- the national health security system is the weakest in the world;
- no country in the world is fully prepared for future epidemics or pandemic threats, and almost every country has serious gaps that need to be addressed;
- most countries, including high-income countries, did not make targeted financial investments in preparedness for an epidemic or pandemic.

The EU is faced with the task of creating an adequate financial model of health care, which in the future will prevent emergency situations in the field of health care and guarantee the control of pandemics.

This is possible only with the implementation of coordinated measures of (1) mobilization of resources, (2) formation of partnerships, (3) expansion of the scope of normative recommendations, (4) increase of technical support and exchange of knowledge for the countries of the European region [22].

The healthcare system of Ukraine found itself in the European pandemic crisis during the transformation of the funding of specialized and highly specialized medical care from the Semashko model to the Beveridge model and has the world average indicator of the 2021GHS index.

Ukraine, with an indicator of 38.9 points, ranks 83rd in the GHS 2021 rating. It is significant that, compared to GHS 2019, Ukraine improved its indicator by +0.9 points due to comprehensive changes in the healthcare system, which made it possible to rise to 11 positions in the rating [20; 21].

However, in our opinion, the unfinished process of implementing the British model of financing the health care system, which has its objective weaknesses, and the pandemic risks of a high degree of economic uncertainty has become a real stress test for Ukraine. As a result, it turned out that the population's reaction to COVID-19 as a period of emergency is disproportionately sensitive compared to its possible socio-economic consequences [8].

In response to the pandemic, many EU countries made changes to their budgets, mobilized reserves, and created special funds. Ukraine, referring to this experience, applied a similar set of measures to increase the adaptive financial sustainability of the healthcare system.

From the State Budget of Ukraine to finance measures to prevent the spread of COVID-19, there was:

- the amount of expenses for the fight against the pandemic is provided for the Ministry of Finance of Ukraine (budget program code - 3511380, name - "Fund for the fight against acute respiratory disease COVID-19, caused by the SARS-CoV-2 coronavirus, and its consequences");
- the amount of expenditures for the National Health Service of Ukraine has been increased (budget program code - 2308060, name - "Implementation of the program of state guarantees of medical care of the population");
- it is allowed to use subventions from the State Budget of Ukraine to local budgets for the implementation of measures related to the socio-economic development of certain territories [23].

Additional loans from foreign financial institutions and organizations were also attracted and funds were allocated from the reserve fund of the State Budget of Ukraine.

Ukraine, duplicating the actions of the EU, tried to apply a similar complex of anti-crisis measures however, the intermediate result had significant differences. Ukraine's first step to contain the pandemic was the introduction of extremely strict quarantine restrictions. Such actions provided for the maximum postponement of the peak load on the health care system, which gave time to strengthen its functionality through financial receipts and logistical changes. On the other hand, strict restrictive measures suppress economic activity, increase unemployment, and reduce the already limited possibilities of the budget.

Against the background of the initial strict quarantine restrictions, there was an almost complete absence of other preventive measures that do not massively restrict rights but are quite effective in combating the epidemic (testing, contact tracing, vaccination). Over time, it was necessary to move from nationwide to adaptive quarantine - the minimum possible restrictions on a separate territory, which are based on a real assessment of the epidemic situation.

The National Health Service of Ukraine has developed a financing mechanism for medical facilities that provide medical care to patients with acute respiratory disease COVID-19. Special packages of guaranteed state funding for providers of emergency, inpatient medical care, testing, and vaccination provided for clearly defined specifications and conditions for purchasing services for the public [24].

Unlike the EU, Ukraine has not organized a powerful system of testing and contact tracing. As of December 31, 2021, the number of tests for COVID-19 in Ukraine was only 385 per 1,000 people, in the EU 2,629 per 1,000 people, and in the United Kingdom 5,846 per 1,000 people. That is, the information obtained from open international databases shows that in the specified time frame, 0.38 tests per person were conducted in Ukraine, 2.6 in the EU, and 5.8 tests in the United Kingdom [25; 26].

From the beginning, testing protocols in Ukraine were not aimed at wide detection and convenience for the patient, even though they were financed from the State budget. At the pre-hospital stage, two ways of obtaining free testing were provided - through the primary medical aid unit or the call of a mobile brigade. This model of access to testing predictably turned testing into a health service with limited availability and contributed to a significant increase in the share of testing in private laboratories at patients' own expense [27].

Unlike the EU, Ukraine was unable to ensure timely mass vaccination. As of December 31, 2021, 32% of the population in Ukraine completed the vaccination course according to the full initial protocol, while in the EU - 69%, and in the United Kingdom - 70.5% [28].

The funding vector of the Ukrainian health care system can be characterized as not focused on disease prevention, which has led to an increase in hospitalizations, the deployment of a large number of beds designated for COVID-19 without proper equipment for quality intensive care, and an increase in the number of deaths.

Consequently, Ukraine's response to the epidemic was reactive due to the increase in infrastructure and reformatting of the hospital sector [27]. Such a logistical miscalculation fundamentally changed the structure of financial costs - since the hospital sector of the healthcare system is the most resource-intensive.

In 2020, the National Health Service of Ukraine paid UAH 19.052 billion to medical institutions within the framework of the Medical Guarantee Program for providing medical care to patients with and suspected of having COVID-19 [24]. The condition for providing such targeted funding was the timely and correct entry of data into the electronic health care system – e-Health [7].

According to the Ministry of Finance of Ukraine, in 2021, the total expenditures of the State Budget of Ukraine for combating the COVID-19 pandemic amounted to UAH 46.4 billion. Here are some of them: payment of services for emergency and inpatient medical care for patients with COVID-19 and vaccination of the population against COVID-19 - UAH 22.4 billion; procurement of vaccines against COVID-19 – UAH 11.4 billion; provision of hospitals with oxygen, diagnostic equipment, express tests and consumables for testing – UAH 2.5 billion; additional payments to the salaries of medical workers - UAH 0.5 billion; other measures in the field of health care - UAH 0.1 billion [28].

The analysis of data obtained from open sources allows us to conclude that there is no timely, complete and effective use of available financial resources. According to the report of the State Audit Service of Ukraine, UAH 20,468.6 million was allocated to the Ministry of Health of Ukraine in 2020-2021 from the Fund to combat acute respiratory disease COVID-19 caused by the SARS-CoV-2 coronavirus and its consequences. ; of them, UAH 17,776.1 million were used; covered by control - UAH 12,548.8 million; financial violations in the amount of UAH 265.7 million were detected, of which UAH 33.5 million were lost [29].

Mistakes in financial and economic calculations and justifications led to the fact that, within the limits of individual budget programs, funds aimed at combating COVID-19 were allocated in volumes greater than needed. Due to spending within the limits of the actual obligations, these allocations were not used by the recipients and were later redistributed among other budget programs. Also, according to the results of the audit by the Accounting Chamber of Ukraine, it was found that in 2020, some healthcare institutions allowed ineffective management of budget funds in the amount of UAH 623.4 million, ineffective use in the amount of UAH 243.1 million, uneconomical use amounted to 36.6 million hryvnias, and use in violation of the legislation reached 679.6 million hryvnias [23].

The fund to combat the acute respiratory disease COVID-19 caused by the SARS-CoV-2 coronavirus and its consequences was created with the aim of preparing the health care system to provide medical assistance to patients with COVID-19, making additional payments to medical workers (who are directly employed on works to eliminate the emergency situation), provision of transfers from the Fund of Compulsory State Social Insurance of Ukraine in case of unemployment and the Social Insurance Fund of Ukraine for financing anti-crisis measures, financing social assistance for the elderly. In 2020 alone, 47 resolutions of the Cabinet of Ministers of Ukraine were published on the allocation and redistribution of funds from the Fund for Combating Acute Respiratory Disease COVID-19, caused by the SARS-CoV-2 coronavirus, and its consequences. On the one hand, this demonstrates a readiness to quickly respond to financial needs, and on the other hand, it indicates shortcomings in calculations and creates a basis for corruption and ineffective channeling of scarce funds.

According to the data of the report of the State Audit Service of Ukraine, in 2020-2021, UAH 67.9 billion was used from the Fund to combat the acute respiratory disease COVID-19 caused by the SARS-CoV-2 coronavirus and its consequences. or 86.6% of the total amount of allocated funds [29].

Adequate distribution of limited financial resources is impossible without a full audit of all levels of medical care.

Analysis of the pandemic experience of the EU countries showed the importance of ensuring not only the financial capacity of health care systems. For the first time, the question of the redundancy of the health care system, as a reserve of financial and resource strength when it is necessary to respond to biological risks of a high degree of temporal and economic uncertainty, became acute.

We consider the EU4Health Program 2021-2027 promising in this direction. The EU4Health Program was adopted to strengthen the EU's crisis preparedness for the period 2021-2027. Its budget was 5.3 billion euros [30]. This is unprecedented financial support from the EU in the field of health care. The EU4Health program is a clear message that health care is a priority for the EU and is one of the main tools paving the way to a European Health Union

The European Commission by its decision of 14.07.2022 approved the Agreement between the European Union and Ukraine on the association of Ukraine to the EU4Health Program (Agreement between the European Union and Ukraine on the association of Ukraine to the EU4Health Program). This Agreement allows the Ukrainian healthcare system to respond to urgent needs through access to EU healthcare funding.

In September 2022, Ukrainian state, communal and private medical, scientific and educational institutions; public and patient organizations began to participate in open tenders for EU4Health Program grant funding. The Agreement also provides for non-competitive direct grants and joint actions.

In our opinion, it is appropriate to consider the pandemic as a powerful multisystem trigger for the organization of health care. It will have the maximum impact on the financial and logistics sectors, which we consider to be the weakest link in local healthcare systems. Against the background of the global pandemic recession, the EU is developing measures for the financial and structural adaptability of healthcare systems when risks are actualized.

The European Commission has established a new European Health Emergency Preparedness and Response Authority (HERA) to ensure the development, production, and procurement of essential medicines, vaccines, and medical protection before and during a crisis; intensively creates a fundamental European Health Care Union, in which all EU countries jointly prepare and jointly respond to challenges in the field of health care; launched a single digital European health data space.

The analysis of the crisis pandemic experience of the EU and Ukraine in conditions of geo-economic instability prompted the authors to introduce the concept of modification stability. By modification stability, we understand transformations in the health care financing system that allow it to cope with unpredictable variations of external and internal influences without loss of functionality, not with the aim of preventing their recurrence, but with the perspective of using it for stable recovery and self-improvement.

DISCUSSION

The collective economic experience acquired by the EU countries and Ukraine as a result of the impact of financial factors during the pandemic crisis was most clearly manifested in the healthcare system. The urgent request for increased funding to ensure the rapidly growing need for medical services has triggered a number of polymorphic anti-crisis measures. At the same time, a retrospective analysis of the economic efficiency of individual measures showed the presence of significant inconsistencies regarding the definition of the essence of financial, social, and epidemiological indicators that characterize the diversity of scientific approaches.

In view of the above, we consider the question of the final result of the intensity of quarantine restrictions in the economic and epidemiological context to be debatable.

We cannot but agree with the expert opinion that "the rigor of forced measures of quarantine restrictions, in the event of risks of the spread of such infections, is inversely proportional to the level of national anti-epidemic resistance" [31].

At the same time, we are convinced that given the epidemiological laws, quarantine restrictions are the basic principle of managing the risks of the spread of infectious diseases, which is directly proportional to the level of national anti-epidemic resistance.

CONCLUSIONS

The SARS-CoV-2 coronavirus pandemic has shown the shortcomings of the healthcare financing systems of the EU and Ukraine. At the same time, it acted as a powerful multisystem trigger and catalyst for the modification of national healthcare systems.

The choice of an effective model of financing the health care system in the conditions of long-term biological risks and a high degree of economic uncertainty is the result of a complex financial and political decision that demonstrates the priority social values and social vectors of the state's development.

It was determined that during the period of geo-economic pandemic instability, a fundamental difference in ensuring the functioning of healthcare systems was clearly outlined. The need for a constructive redistribution of limited financial resources to combat the pandemic was combined with a global shortage of unique specialized resources (medical personnel, ventilators, vaccines, etc.). Therefore, for the first time, healthcare systems faced the problem that the availability of financial opportunities did not guarantee the availability of the necessary resources and did not protect against the collapse of the medical system.

Systemic analysis and cumulation of individual and collective variable experience of responding to the pandemic economic recession of the healthcare systems of EU countries and Ukraine will make it possible to create a standard of financial readiness for the destabilizing effects of emergencies in the future.

Only the potential of the structural adaptability of the economy when actualizing the risks of future pandemics will contribute to the mobilization of optimal amounts of resources in the healthcare system. At the same time, the potential of structural adaptability of the economy depends on the cost of resource provision and the implementation of state healthcare development programs with an emphasis on preventive measures (affordable testing, mass vaccination, etc.).

Investments in the Ukrainian healthcare sector should be increased by expanding budget funding and prioritizing healthcare in budgets at all levels; improving of the resource management system; comprehensive monitoring of emergency situations, adequacy of measures in response to them, and final results.

The study showed that all countries are interested in receiving comprehensive, systematized analytical data on available financial and other resources, identifying risks and specific action algorithms for effective protection of their own population from predicted biological threats. The existing Global Health Security Index, Government Stringency Index, Containment, and Health Index are significant but have a number of local limitations, so they are not universal. Only the combination of their application will make it possible to significantly influence the development vector of the health care system.

The EU and Ukraine face the task of creating an adequate financial model of health care that will guarantee the control of pandemics. This is only possible if coordinated measures are implemented between countries within the framework of the European Health Emergency Preparedness and Response Authority (HERA), the EU4Health program, etc.

We consider the launch of a single digital European Health Data Space to be extremely far-reaching for Ukraine. The electronic health care system of Ukraine (e-Health) has accumulated an invaluable base of statistical and financial information after the peak pandemic load. A systematic analysis of these local indicators will indirectly influence global critical points in the reform of the EU health care system and determines the role, place, and path of Ukraine to the European Union of Health Care.

In modern conditions, the issue of retrospective evaluation of the economic feasibility of the degree of strictness of quarantine restrictions in the EU countries and Ukraine is becoming relevant. The question of generating anti-crisis cases with high economic efficiency while guaranteeing epidemiological adequacy has become acute.

The analysis of the crisis pandemic experience of the EU and Ukraine in the conditions of geo-economic instability prompted the authors to introduce the concept of modification stability of healthcare financing systems. By modification resistance, we understand transformation processes in the health care financing system, which make it possible to overcome unpredictable variations of external and internal influences without loss of functionality, not with the aim of preventing their recurrence, but with the perspective of stable recovery and self-improvement.

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МОДИФІКАЦІЙНА СТІЙКІСТЬ СИСТЕМ ФІНАНСУВАННЯ ОХОРОНИ ЗДОРОВ'Я В УМОВАХ ГЕОЕКОНОМІЧНОЇ НЕСТАБІЛЬНОСТІ: СИТУАТИВНИЙ АНАЛІЗ ПАНДЕМІЧНОГО КРИЗОВОГО ДОСВІДУ ЄС ТА УКРАЇНИ

Глобальний досвід систем фінансування охорони здоров'я, набутий у результаті геоелекономічної пандемічної кризи 2020-2022 років, потребує глибокого системного ретроспективного вивчення.

У статті обґрунтовано, що пандемія коронавірусу SARS-CoV-2 показала слабкість систем охорони здоров'я ЄС та України. Проте її доцільно розглядати як потужний мультисистемний тригер та каталізатор трансформації систем охорони здоров'я, максимальний вплив якого прогнозується у фінансовому та логістичному секторах, які вважаються найслабшою ланкою локальних систем охорони здоров'я.

Визначено, що в період геоелекономічної пандемічної нестабільності чітко окреслилась принципова відмінність у забезпеченні функціонування систем охорони здоров'я. Потреба в конструктивному перерозподілі обмежених фінансових ресурсів для протидії пандемії поєднувалася з глобальним дефіцитом унікальних спеціалізованих ресурсів.

У процесі аналізу розкрито економічну, епідеміологічну та соціальну ефективність застосування індексу жорсткості уряду (Government Stringency Index (GSI)), індексу стримування й здоров'я (Containment and Health Index (CHI)) та Глобального індексу безпеки здоров'я (Global Health Security Index (GHS)).

У дослідженні підтверджено, що в періоді геоелекономічної нестабільності в ЄС концептуалізувалося поняття глобальної колективної відповідальності та підвищення стійкості системи фінансування охорони здоров'я в межах діяльності Європейського органу з питань готовності до надзвичайних ситуацій у сфері охорони здоров'я та реагування (HERA); програми EU4Health; єдиного цифрового Європейського простору даних охорони здоров'я.

Автори ввели поняття модифікаційної стійкості систем фінансування охорони здоров'я, під яким мають на увазі процеси трансформації системи фінансування охорони здоров'я, що дають змогу без втрати функціональності подолати непрогнозовані варіації зовнішніх та внутрішніх впливів не з метою запобігання їхньому рецидиву, а з перспективою стабільного відновлення та самовдосконалення.

Ключові слова: геоелекономічна нестабільність, система охорони здоров'я, фінансування, стійкість, пандемія COVID-19, індекс, GSI, CHI, GHS

JEL Класифікація: F30, G28, I18