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ECONOMIC TRANSFORMATIONS OF HEALTHCARE IN UKRAINE IN WARTIME CONDITIONS

Summary. *The article substantiates the need to transform the key strategic objectives of the healthcare system of Ukraine, adjusted in accordance with the changing conditions of our time. The purpose of the article is to determine the economic changes in the strategic priorities for the development of the healthcare system in the conditions of the war and post-war conditions to ensure the protection of public health. The methodological base of the study is the applied research of the WHO, the State Statistics Committee, applied research of the Ministry of Health, the Ministry of Economic Development and Trade of Ukraine, the Department of Strategic Planning and Macroeconomic Forecasting. Based on the analysis of indicators for achieving Goal 3 of the Sustainable Development Goals in Ukraine in 2017-2020, the forecast value of indicators for 2023, 2025 was calculated. The consequences of a full-scale military invasion of the Russian Federation in Ukraine and its impact on the domestic healthcare system were studied. Changes in the strategic priorities for the development of the health care system of Ukraine under martial law have been determined. In the conclusions, the authors identify the priorities for the development of the healthcare system in Ukraine in the post-war state (injuries, maternal and newborn health, treatment of chronic and non-communicable diseases, minimizing the risks of infectious diseases, protection issues, mental*

health and psychosocial support, potential chemical and nuclear hazards, global management of COVID -19 and others and key events (alignment of national and global targets and indicators of the CSR, expansion of fiscal space for sustainable financing of health care, development of international partnerships, human resources and public health policy, WHO international support for the health system, medical workers and patients in Ukraine, respect for international humanitarian law, human rights and protection of the civilian population, improving the state of immunization at the local level) to implement an updated strategy for the development of the healthcare system injuries in Ukraine.

Key words: *strategy, transformation, medical sector, sustainable financing, state of emergency, martial law, financial assistance, financial contributions, sustainable development.*

Statement of the problem. The foundations for the formation of the healthcare system, approved at the legislative level, regulate social relations and determine the organizational, legal, social, and economic foundations of such a system in Ukraine. In the context of the environmental crisis, the pressure of non-communicable and infectious diseases, the COVID-19 pandemic, ensuring the inalienable right to health and life for every person is the main task of the modern medical industry, which is approved by international acts of the United Nations, the World Health Organization (WHO). However, due to Russia's military aggression against Ukraine in 2014 and 2022, this right has been violated. The consequence of such actions was the destruction of the life support systems of the population and the lives of citizens of Ukraine as a whole, the general infrastructure of the country. In such circumstances, the healthcare sector should remain a priority of the government's public policy. Organizational and economic instruments of state policy should be aimed at protecting medical institutions, workers whose activities are focused on providing the population

with the necessary medical care and continuous life saving. Therefore, it remains relevant to determine the directions for transforming the strategic economic and organizational tasks of the healthcare system of Ukraine, adjusted in accordance with the conditions of the present.

Analysis of recent researches and publications. The work of foreign and domestic scientists has already made a significant contribution to the study of the experience of strategic planning of health care system development taking into account global, European integration processes and emergencies.

Theoretical analysis of the stages, features and regulatory support of the reform of the modern health care system in Ukraine was conducted by A. Barzylovykh [1], who, taking into account all levels of regulatory support, singles out licensing and accreditation of healthcare institutions among the areas of industry transformation; the quality of medical services and the quality of medical care; social health insurance; standardization of medical care; financing of medical institutions; autonomy and decentralization of medical institutions; prevention, diagnosis and treatment of certain types of diseases.

Voronenko Y. [2], Goyda N. [2] studied certain pan-European areas of health care policy and identified the main strategic approaches to reforming health care.

Based on the generalization of the experience of introducing electronic services into the practice of functioning of medical institutions and the analysis of structural changes in the field of healthcare, Orlova N. [3-4] identified the main directions for transforming the healthcare system (ensuring fair and equal access to medical services, introducing an effective information policy, ensuring microeconomic efficiency and macroeconomic control of health spending). Informatization as a tool for the development of public information policy in the field of health care in Ukraine has been studied in the scientific works of Bratyshko Yu. [4], Degtyara O. [4], Derenska Ya. [4], Kozyreva O. [4], Orlova N. [3-4].

Pashkov V. [5] conducted a comparative analysis of international and national regulatory support and identified areas for modernization in the healthcare sector, mainly in the direction of financing, taking into account the existing healthcare infrastructure. According to Petrova S. [6], the transformation of the state health policy includes the following areas: demonopolization, the introduction of a multi-channel financing system for the medical industry, the development of primary health care, and advanced training of medical personnel. Scientific researches of Zaporozhets T. [7], Lekhan V. [8], Slabkogo G. [8], Shevchenko M. [8] are devoted to the analysis of digital transformational changes of the domestic health care system, which should contain the main visions, conceptual foundations, priorities and principles of the health care industry in the current conditions of reform.

Marek Ćwiklicki [9], Mariusz Duplaga [9], Jacek Klich [9] identified current issues of the health care system in the technological revolution and considered the areas of adaptability of the health care system taking into account the interaction of key stakeholders (NGOs, patients, health workers state) in Europe, America and Asia.

Recognizing the indisputable achievements of the above-mentioned scientists, further research is needed on the current transformational economic changes in the health care system in a global pandemic and as a result of a full-scale military invasion of Ukraine by the Russian Federation.

The purpose of the article is to identify economic changes in the strategic priorities of the health care system of Ukraine in martial law and postwar to ensure the protection of human health.

The methodological basis of the study is the following methods: systematization and generalization (during the study of the structure of the world fund in case of emergencies, directions for the use of international financial assistance for health care in Ukraine in war conditions), methods of analysis and synthesis (when determining the vectors of development of the modern state

policy of Ukraine in health care, highlighting the consequences of a full-scale military invasion of the Russian Federation in Ukraine), a predictive method (when determining predictive indicators for achieving Goal 3 of the Sustainable Development Goals in Ukraine using Excel statistical functions based on linear regression), comparative analysis (to determine countries - donors forming an emergency fund, the volume of their contributions and countries providing financial contributions to meet the needs of the population in the framework of the implementation of Goal 3 of the Sustainable Development Goals).

Information base for the study is applied research by the WHO, the State Statistics Committee, applied research by the Ministry of Health, the Ministry of Economic Development and Trade of Ukraine, the Department of Strategic Planning and Macroeconomic Forecasting.

The main material. In Art. 4 of the Law of Ukraine "Fundamentals of the legislation of Ukraine on health care" summarizes the conceptual foundations of the health care system of Ukraine. The type of health care system enshrined in the Law is based on the principles of the English model and is manifested in the forms of insurance, private and family medicine, high social standards, and multi-source funding.

The main socio-economic principles for ensuring a high-quality and efficient health care system in Ukraine are: protection of human rights, rule of law, good governance, participation of public, business and social partners, integration of policy and governance, use of best available knowledge, prevention principle.

Modern state policy of Ukraine in the field of health care, taking into account the regulations of the international level (Sustainable Development Goals - SDG), as well as the main strategic documents of the national level, focused on vectors:

- development - ensuring the sustainable development of the above sector and the implementation of appropriate structural reforms;

- security - ensuring the safety of workers, citizens, the implementation of effective mechanisms to combat corruption (priority on health, life, human security, which is impossible without the provision of appropriate medical services, an effective public health system, etc.);
- responsibility - providing guarantees to every citizen, regardless of skin color, race, religion, political beliefs, social and ethnic origin, gender, place of residence, property status, language or other characteristics, have access to quality services in the private and public sectors, high quality health care systems.

By the Decree of the President of Ukraine, the global goals of sustainable development are regulated in the National Report "Sustainable Development Goals: Ukraine until 2030" Goal 3. Ensuring a healthy lifestyle and promoting well-being for all at any age. Goal 3 has adapted indicators of definition [10], the analysis of which according to statistical indicators before the introduction of martial law in Ukraine (period from 2017-2020) is given in table 1.

Table 1

Indicators of achieving Goal 3 of the Sustainable Development Goals in Ukraine in 2017-2020 with the calculation of the forecast value

Indicator	2017	2018	2019	2020	2023 (forecast)	2025 (forecast)
Task 3.1. Reduce maternal mortality						
3.1.1. Number of maternal deaths per 100,000 live births	9,1	12,5	14,9	11,8	16,8	18,9
Task 3.2. Minimize preventable mortality among children under 5 years of age						
3.2.1. Mortality of children under 5 years of age, cases per 1,000 live births	8,9	8,3	8,2	8,5	7,89	7,63
Task 3.3. Stop the HIV / AIDS and tuberculosis epidemics, including through the use of innovative practices and treatments						
3.3..1. Number of patients diagnosed with HIV for the first time in their lives per 100,000 population	42,8	42,8	42,6	30,9	23,62	16,44
3.3.2. Number of patients diagnosed with active tuberculosis for the first time in their lives, per 100,000 population	51,9	50,5	60,1	51,7	57,6	59,4
Task 3.4. Reduce premature mortality from non-communicable diseases						
3.4.1. Number of deaths of men from cerebrovascular diseases aged 30-59 years, per 100,000 men of the corresponding age	62,3	62,1	57,3	56,2	49,08	44,46
3.4.2. Number of deaths of women from cerebrovascular diseases aged 30-59 years, per 100,000 women of the corresponding age	26,7	25,5	23,4	25,5	22,71	21,57

3.4.3. Number of deaths from malignant breast cancer aged 30-59 years, per 100,000 women of appropriate age	24,3	24,1	22,6	23,0	21,07	19,99
3.4.4. Number of deaths from cervical cancer between the ages of 30 and 59, per 100,000 women of that age	12,0	11,5	11,7	10,1	8,85	7,75
Task 3.5. Reduce premature mortality by a quarter, including through the introduction of innovative approaches to disease diagnosis						
3.5.1. Probability to die in 20-64 years, men, %	0,38	0,39	0,38	0,36	0,35	0,34
3.5.2. Probability to die in 20-64 years, women, %	0,15	0,15	0,14	0,15	0,15	0,15
Task 3.6. Reduce the level of serious injuries and deaths due to road accidents, including through the use of innovative practices of resuscitation, treatment and rehabilitation of road accident victims						
3.6.1. Number of deaths due to traffic accidents per 100,000 population	12,1	10,5	10,9	11,0	9,82	9,24
3.6.2. Number of serious injuries received as a result of traffic accidents / road accidents, per 100,000 population, % to the level of 2015 (depending on the mode of transport)	-	-	-	-	-	-
Task 3.7. Provide general high-quality immunization of the population with the use of innovative drugs						
3.7.1. Level of immunoprophylaxis coverage according to the National Vaccination Calendar (according to medical indications), % (depending on age group and disease)	-	-	-	-	-	-
Task 3.8. Reduce the prevalence of smoking among the population through innovative means of informing about the negative effects of smoking						
3.8.1. Proportion of smokers among women aged 16–29, %	5,2	4,8	7,5	4,5	5,77	5,89
3.8.2. Proportion of smokers among men aged 16–29, %	28,9	27,9	29,3	27,0	26,34	25,48
Task 3.9. Reform the financing of the health care system						
3.9.1. Share of household expenditures in total health expenditures, %	47,45	48,24	48,20	40,0	35,89	31,42

Source: compiled and calculated by the authors according to [11-12]

To determine the forecast value of indicators for the implementation of tasks to achieve Goal 3 used one of the statistical functions of Excel - PREDICTION (x; data set y; data set x). The linear regression function calculates the future value from the specified values. According to the results of the forecast in 2023, 2025, indicators 3.2.1, 3.3.1, 3.6.1, 3.8.1, task indicators 3.4, 3.5, 3.9 have a positive trend. Indicators 3.1.1, 3.3.2, 3.8.1 in 2023, 2025 have a negative trend. This year's figures (2022) will worsen overall strategic indicators under the influence of drastic changes in the country's population structure, large human losses, deteriorating access to health services, and so on.

With the beginning of the full-scale Russian invasion of Ukraine, the government adopted a number of decisions regarding the analysis of state budget expenditures and setting priority goals for funding (support for people affected

by the war, providing state guarantees to health workers). The Cabinet of Ministers of Ukraine adopted a resolution dated April 12, 2022 № 281-r on the redistribution of expenditures in the medical sector by reducing consumption expenditures and increasing development expenditures under the program "Improving health care at the service of people" in the amount of 200200 thousand UAH.

Due to the war, the Ministry of Health temporarily changed the approach to the financing of health care facilities under the Medical Guarantees Program. Most health care facilities receive funding through a health guarantee program totaling UAH 157.3 billion. (+ UAH 33.4 billion compared to 2021). Each medical institution receives 1/12 of the annual contract amount from the National Health Service of Ukraine on a monthly basis in order to provide medical institutions with the necessary funding and maintain human resources. Electronic reporting may not be submitted temporarily. According to the State Treasury Service, UAH 49.2 billion was allocated for the payment of medical services under the medical guarantee program, of which UAH 12.4 billion was allocated in April. Since the beginning of the war, medical institutions have received more than UAH 15 billion.

A subvention of local budgets in support of individual institutions and measures in the health care system in the amount of UAH 2.2 billion is provided to pay for the work of employees of public health care facilities that are not included in the health guarantee program.

In the world practice, the Contingency Fund for Emergencies (CFE) has been established for the harmful (within 24 hours) solution of medical emergencies, which provides WHO resources. This rapid approach to dealing with emergencies reduces economic and social risks and guarantees the financial security of vital operations in conditions of limited financial resources. The total amount of the CFE fund amounted to 261.77 million dollars. USA. The top five CFE contributors include the Netherlands (\$ 2.35 million), the United Kingdom

(\$ 5.59 million), Norway (\$ 8.07 million), and Germany. (31.65 million US dollars), USA (49.65 million US dollars), (Table 2).

Table 2

TOP-10 countries that form the CFE fund in 2017-2022, million USD

Country	2017	2018	2019	2020	2021	2022	ВсЬого
Germany	9.88	15,22	17.12	4,51	31,65	-	83,19
USA	-	-	-	-	-	49,65	49,65
Japan	-	-	22,06	-	-	-	32,89
United Kingdom	1,1	5,64	5.24	-	5,59	-	27,00
Netherlands	-	1,17	2,35	6,79	1,18	1,18	12,57
Norway	-	1,25	1,17	2,58	3,47	4,60	13,08
Sweden	-	4,41	1,03	4,19	-	-	10,79
Canada	0,75	0,75	0,74	1,46	1,62	-	6,05
Denmark	-	3,19	-	1,21	-	-	4,39
Australia	-	3,04	0,35	-	-	-	3,39

Source: according to [13]

Georgia, Estonia, Canada, China, Kuwait, Luxembourg, New Zealand, Portugal, the Philippines, France, and Switzerland are participating in the formation of a fund structure aimed at implementing effective and timely government action in the field of health care.

After the start of the war on February 24, 2022, as of May 2, the WHO Regional Office for Europe, the Office of the United Nations High Commissioner for Refugees (UNHCR) released information on the number of killed and wounded in Ukraine: 3,300 wounded, 170 children, 80 boys, 69 girls, 324 women, 395 men), killed 3.2 thousand people (including 72 children, 83 boys, 71 girls, 722 women, 1115 men). As a result of the armed conflict, more than 5.6 million Ukrainians crossed the border with neighboring countries, of whom 54% found refuge in Poland (over 3 million people) and 15% in Romania (0.8 million people). About 13 million Ukrainians changed their place of residence within Ukraine during the first two months of the war, of which 17% received the status of internally displaced persons (7.7 million people) [13].

Since the beginning of the armed conflict on February 24 and May 4, the number of attacks by the aggressor on medical institutions and their staff,

patients, infrastructure of the health care system of Ukraine is constantly growing. Thus, 186 attacks were recorded during this period. The result of such attacks is 126 victims, of whom 73 died, 53 were hospitalized [13].

In the context of the Russian invasion, the Ministry of Health of Ukraine (MOH) is supported by the WHO, which also supports refugee-receiving countries to ensure the safe medical evacuation of patients. The German non-governmental organization supporting EMT and the CADUS team coordinate the process of transporting patients across the border to the European Union. The National Emergency Service provides transportation of patients within Ukraine. To date, 110 psychiatric patients have been evacuated to facilities in Spain via Poland and more than 200 Ukrainian patients to 11 European countries (Belgium, Denmark, Ireland, Spain, Italy, Germany, Norway, Luxembourg, Portugal, Romania, Sweden).

As of May 4, WHO received \$ 46.5 million. The United States (81%) to meet the needs of 6 million people (Figure 1), of which \$ 12.5 million is intended to provide and support the health of citizens affected by the conflict; \$ 45 million USA - to adapt the current health care system in Ukraine to emergency conditions.

In the first weeks of the war, the WHO allocated 10.2 million dollars to Ukraine. The United States from its contingency fund for emergencies. CFE financing has the following advantages in the overall system of the global financial market: rapid response within 24 hours, high availability of financial resources, operational payment cycles upon receipt of a request for an emergency. The total expenditures of the CFE Fund in 2022 total \$ 26.87 million (Fig.1)

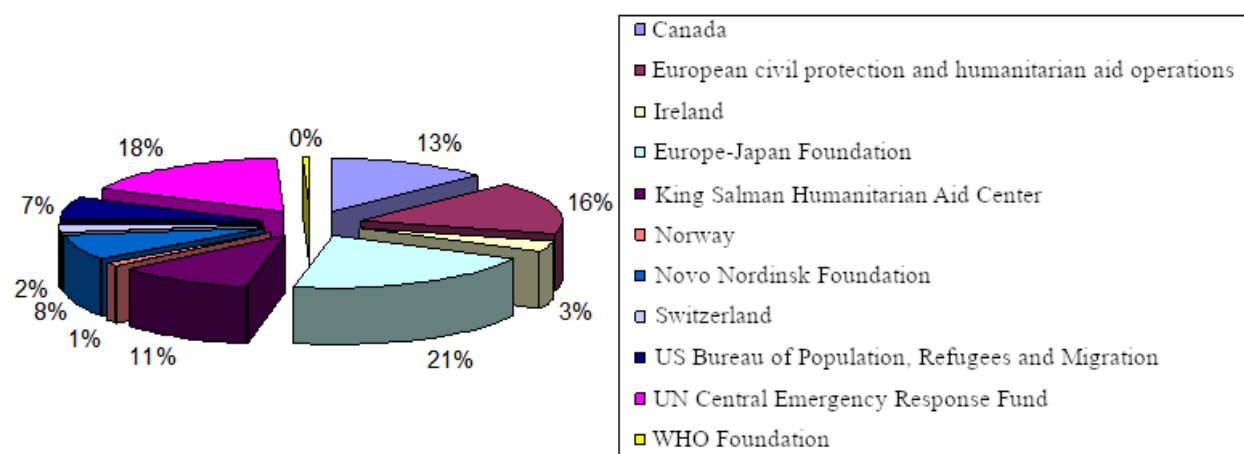


Fig. 1. The structure of donor contributions to WHO to meet the needs of the population in the implementation of Goal 3 of the Sustainable Development Goals in 2022, %

Source: compiled by the authors according to [13]

Since the beginning of the armed conflict in February 2022, \$ 1.4 billion has been allocated to Ukraine from the CFE Fund (Table 3).

Table 3

Payments from the CFE Fund in 2022, USD

Country	Emergency situation	Type	Sum
Regional Africa (Sahel)	The Sahel crisis	Emergency Situations Complex	8 350 567
Mozambique	Tropical storm Gombe	Natural disaster	1 218 676
Ethiopia	Drought / Lack of food	Emergency Situations Complex	3 154 144
Ukraine	Conflict (Ukrainian crisis)	Emergency Situations Complex	5 000 000
Benin	Cholera	Outbreak of the disease	277 140
Ukraine	Conflict (Ukraine)	Emergency Situations Complex	1 400 000
Regional Europe (Ukrainian crisis)	Conflict (Ukraine)	Emergency Situations Complex	3 518 572
Malawi	Tropical storm Ana / Flood	Natural disaster	398 600
Afghanistan	Measles	Outbreak of the disease	1 500 000
Nigeria	Lassa fever	Outbreak of the disease	206 000
Regional Africa (Guinea, Sierra Leone)	Ebola (Guinea) / Vaccination	Outbreak of the disease	233 400
Madagascar	Flooding	Natural disaster	253 275
Ukraine	Conflict	Emergency Situations Complex	310 000
Sudan	Civil unrest	Emergency Situations Complex	80 000
Belarus	Migrant crisis	Emergency Situations	50 000

		Complex	
South Sudan	Flooding	Natural disaster	462 200
Cameroon	Cholera	Outbreak of the disease	456 425

Source: according to [13]

Given the growing need for quality medical care during the armed conflict, access to medical services is quite limited. The main drugs to which access is limited in the country are drugs for hypertension (39%), painkillers (46%), drugs for cardiovascular disease (40%). The WHO makes a significant contribution to guaranteeing medical care in the regions of Ukraine most affected by the war. Thanks to the efforts of the WHO, 393 metric tons of medical supplies for the treatment of injuries were delivered to Ukraine (interdepartmental emergency aids, kits for emergency surgery, basic medicines, ambulances, body bags, refrigerators, electric generators, other equipment). WHO humanitarian aid includes primary and surgical medical supplies, trauma treatments: insulin, oxygen, surgical supplies, blood transfusion kits, anesthetics, defibrillators, oxygen generators, rehydration salts, monitors, bandages, gauze, and more.

In order to support the guaranteed constitutional rights of citizens to life and health, the continuous implementation of the most important medical services in the conflict in Ukraine, the purchase of goods is carried out: 431.5 thousand dollars. The United States to manage the cold chain supply system; \$ 1.62 million USA - for biological, chemical, nuclear, radiological, explosives; \$ 4.8 million for surgical equipment; \$ 6.4 million USA - for primary care [14].

During 2022, the possibility of using World Bank funds (about \$ 45 million) to provide hospitals with priority medical equipment under martial law was agreed upon, and more than 700,000 drugs were delivered to the country for anesthesia and treatment of the wounded. WHO, in cooperation with the Ministry of Health, handles donations of medical equipment, medicines from non-governmental organizations (Direct Relief Project, FootPrint, European Blood Alliance), government partners (European Commission and Ontario,

Canada), biotechnology and pharmaceutical companies (Novo Nordisk, Reig Jofre, Roche, Seegene) [13].

In connection with the military aggression of the Russian Federation against Ukraine, the Ministry of Health took a number of decisions in 2022 to improve health care, including: legal consolidation of opportunities to involve students in pharmacies, ensuring the coordination of the working group on treatment of Ukrainian citizens in foreign clinics during martial law in Ukraine, development of Guidelines for tactics of surgery to control injuries and stabilize the victims during the evacuation, approval of the legal framework for procurement of drugs under centralized programs, simplification of medical and social examination [15]. During the war, e-medicine gained momentum. In Ukraine, psychotherapists have created a support chat "How are you?"; portal Help24, where psychologists provide free advice to anyone in online chats.

Insights from this study and perspectives for further research in this direction. Economic security of health care is the main mechanism for meeting the immediate needs of martial law. Financial assistance from the WHO and other international organizations in Ukraine and abroad has become an important and necessary support for the Ukrainian population.

Therefore, the economic mechanisms of international and state regulation of health care are focused mainly on the following issues: newborn and maternal health, access to critical medical services, primary and surgical health care; medical evacuation, injuries. Also important are: psychosocial support and mental health, treatment of chronic and non-communicable diseases, potential nuclear and chemical hazards, minimization of infectious disease risks, protection (gender and sexual and violence risks, trafficking risks), global governance of COVID-19, health risks and technological hazards.

In order to accelerate the achievement of the Sustainable Development Goal 3 in Ukraine in the post-war period, it is necessary to take actions based on coordination, intensification and prioritization of measures: continuing the

implementation of global goals to national indicators (Sustainable Development Goals); development of partnership relations in the health care system based on the formation of a stable financial space; transformation in human resources training and public health policy; continuing international support for WHO; observance of international humanitarian law, human rights and protection of civilians; improving the state of immunoprophylaxis at the local level.

Achieving positive results in these priority areas will increase the government's preparedness for the pandemic, ensure fair access to high-quality medicines and services, and implement an updated strategy for the development of Ukraine's health care system towards sustainable development.

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