

Analytical review of the influence of socio-economic factors on the state of pharmaceutical care for patients with cardiovascular diseases

Natalia A. Bilousova, Vasyl M. Mykhalchuk

SHUPYK NATIONAL HEALTHCARE UNIVERSITY OF UKRAINE, KYIV, UKRAINE

ABSTRACT

Aim: To investigate the influence of socio-economic factors on the state of pharmaceutical provision of patients with cardiovascular diseases.

Materials and Methods: To achieve the goal of the research, scientific publications posted in Ukrainian information and scientific databases (NRAT, OUCI) and scientometric databases Scopus, Web of Science, PubMed, MedLine, BMJ, Embase were used. The analysis of international and domestic legal documents was carried out, the sites of global international organizations, the sites of cardiology societies and Ukrainian statistical data bases were researched. The methods of content analysis, synthesis, systematization, and generalization were used.

Conclusions: As a result of the study, socio-economic factors that affect the state of pharmaceutical provision of patients with CVD (in particular, CAD) were determined. In this study, among the specified socio-economic factors, the need to update the regulatory and legal security of the pharmaceutical care process attracts the most of attention. The positive impact of the use of modern drug pharmacotherapy for coronary artery disease on the budget of the health care system in clinical practice proposed by the ESC was determined.

KEY WORDS: Pharmaceutical care, health technology assessment, cardiovascular diseases

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INTRODUCTION

According to WHO global statistics, CVDs account for 9.7% of the global burden of diseases [1] and are the main cause of mortality. In the world ranking of CVD mortality for 2021, Ukraine ranked fourth after Tajikistan, Azerbaijan, and Uzbekistan and the first among European countries [2]. It is believed that in order to reduce the number of non-communicable diseases (NCDs) in the world, their early detection, screening and treatment (effective management) are necessary. World statistics indicate the highest mortality from CVD – 17.9 million people per year; in particular, 77% of deaths from NCDs occur in countries with an average and low income level, which includes Ukraine [3]. The full-scale war unleashed by Russia in Ukraine brought not only destruction and damage to the health care (HC) system, but also affected the socio-economic status of the Ukrainian population and led to an increase in the number of Ukrainian citizens with behavioral and metabolic risk factors for CVD [4]. As of July 2022, 70% of the population of Ukraine had mental health disorders [5], the influence of environmental factors, improper nutritional conditions, deterioration of sleep quality and regime, irrational nutrition, access to medicines in the front-line territories and in the occupation zone, the provision of medical assistance, socio-economic factors associated with the growth of unemployment and the economic crisis in the country.

Violation of the logistic routes of supply of medicines and active pharmaceutical ingredients led to an acute shortage of drugs used for NCDs, in particular for CVD in the process of pharmaceutical provision of the population [4]. The state program “Reimbursement of medicines and medical products under the program of state guarantees of medical care for the population” [6], which provided Ukrainian citizens with drugs used for CVD, significantly decreased during the first two months of the war, and the price of these drugs “increased by almost 100%” [7].

Therefore, one of the priority tasks of Ukraine in the long term is to meet the needs of citizens in health and medical care in the context of health preservation during the war and post-war periods [8]. In view of the spread of morbidity and mortality from coronary heart disease, the question of the impact of socio-economic factors on the pharmaceutical provision of medicines and MDs for the citizens of Ukraine to provide access to high-quality and safe pharmaceutical drugs and MDs used in the rational pharmacotherapy of coronary heart disease acquires important practical significance.

AIM

The aim of the study was to investigate the influence of socio-economic factors on the state of pharmaceutical provision of patients with cardiovascular diseases.

MATERIALS AND METHODS

To achieve the goal of the research, scientific publications posted in Ukrainian information and scientific databases (NRAT, OUCI) and scientometric databases Scopus, Web of Science, PubMed, MedLine, BMJ, Embase were used. An analysis of international and domestic legal documents was carried out, the sites of global international organizations, the sites of cardiology societies, and Ukrainian statistical data bases were researched. The methods of content analysis, synthesis, systematization, and generalization were used.

REVIEW AND DISCUSSION

As defined by the American National Heart, Lung and Blood Institute, CAD is a type of heart disease in which the arteries of the heart do not supply enough oxygenated blood to the heart through the main vessels, resulting in myocardial ischemia. At the same time, damage to the large coronary arteries of the heart is observed due to the accumulation of cholesterol, which forms plaques that subsequently block blood flow in the vessels, as well as possible damage to the small arteries of the heart in the heart muscle (ischemic microvascular heart disease) [9]. According to the Clinical Guideline "Stable coronary artery disease", CAD is "a dynamic process of accumulation of atherosclerotic plaques and functional changes in coronary circulation, which can be changed by lifestyle, pharmacotherapy and revascularization" [10].

International experience concerning the prevention and treatment of coronary artery disease, as well as the results of international works and best clinical practices, are reflected in clinical guidelines, instructions, recommendations, which are used in clinical practice by cardiologists of the world and on which they orientate. Scientific interest is represented by the European Society of Cardiology (ESC) [11], the American Heart Association (AHA) [12], the European Society of Thoracic Surgeons (ESTS) [13], and the British National Institute for Health and Care Excellence (NIH) [14].

The strategic plan of the ESC for 2023-2028 is aimed at the development of advanced and innovative technologies, primary, secondary and tertiary prevention. It is important to provide high-tech patient-oriented medical care; obtaining qualitative evidence on the effectiveness of the use of innovative medical technologies and their further implementation in medical practice, which in the future will affect cost savings in health care; education of medical personnel and patients; digital medicine, artificial intelligence and the use of analytics of a large database [15].

The main regulatory and legal documents that regulate the provision of medical care to patients with coronary artery disease in Ukraine are the Constitution of Ukraine (Chapter 2, Article 49) [16], the Law of Ukraine "Basics of the Legislation of Ukraine on Health Care" [17], the Order of the Ministry of Health of Ukraine "On the approval of the Unified clinical protocol of primary, secondary (specialized) and tertiary (highly specialized) medical care "Stable coronary artery disease" [18], Evidence-based clinical guideline "Stable coronary artery disease" [10], Unified clinical protocol of primary, secondary (specialized) and tertiary (highly

specialized) medical care [19]. It is worth noting that the domestic clinical guideline and clinical protocol were developed on the basis of the recommendations (2011 and 2013) of the above-mentioned international organizations. These documents are reviewed every five years, while the above-mentioned international organizations review these recommendations every year. It is worth noting that the Association of Cardiologists of Ukraine republishes the collection "Cardiovascular diseases. Classification, standards of diagnosis and treatment" [20], which is updated in accordance with the new recommendations of the above-mentioned international organizations. These documents form a regulatory framework dedicated to the diagnosis, treatment and prevention of stable coronary artery disease based on evidence of the effectiveness of various interventions used in modern clinical practice.

The International Pharmaceutical Federation (FIP), with the support of the World Heart Federation and the European Community of Clinical Pharmacists, has developed an action plan for the integration of pharmacists in the treatment of CVD. Guidelines for providing pharmaceutical care to the population with CVD are patient-centered and aimed at CVD prevention and control, identification and prevention of modifiable risk factors, and evidence-based, high-quality and safe pharmacotherapy. Particular attention is paid to the pharmaceutical provision of drugs in accordance with the pharmacotherapy of CVD proposed by the FIP [21].

It should be noted that the provision of pharmaceutical assistance and pharmaceutical support to the population of Ukraine is regulated by the Law of Ukraine "On Medicinal Products" [23] and the Law of Ukraine "Basics of Health Care Legislation" [24]. The pharmaceutical provision of health care institutions is additionally regulated by the "Nomenclature of pharmaceuticals and medical devices under the direction "Medicines and medical products for health care institutions to provide treatment of patients with cardiovascular and cerebrovascular diseases" [25], the list of pharmaceuticals offered for reimbursement medicines and MDs according to the program of state guarantees of medical care for the population [26], as well as the National List of Medicines [27]. In addition, when providing pharmaceutical care to patients with CVD, pharmacists are guided by the "Protocols of Pharmacists for Dispensing Medicines for the Treatment of CVD, which are subject to reimbursement" [22] and the guidelines of Good Pharmacy Practice (GPP), which are of a recommended nature [28]. Separately, we note that in the conditions of emergency situations of man-made and inartificial nature, in order to overcome their consequences, the "Regulation on departmental, regional and local reserves" was approved medications and MDs in case of emergency situations" [29], which was adopted in 2001 and requires revision.

Our analysis of the domestic legal framework regarding the provision of pharmaceutical care to patients with CVD and the pharmaceutical provision of pharmacotherapy and MD indicates the need to improve the compliance of the "Protocols of pharmacists when dispensing pharmaceuticals for the treatment of CVD that are subjected to reimbursement" [22]

with the “Unified clinical protocol of primary, of secondary (specialized) and tertiary (highly specialized) medical care “Stable coronary heart disease” and “Evidence-based clinical guideline “Stable coronary heart disease” [10, 19]. We reviewed the list of drugs proposed for pharmacotherapy by the “Unified clinical protocol of primary, secondary (specialized) and tertiary (highly specialized) medical care “Stable coronary artery disease” and the list of drugs offered for reimbursement under the program of state guarantees of medical care for the population needs appropriate revision by development of sound methodological and economic principles based on the principles of Health Technology Assessment (HTA). In accordance with the “Procedure for the inclusion (exclusion) of medicinal products in (from) the National list of essential medicinal products and/or in (from) the lists of medicinal products purchased from the state budget for the implementation of programs and implementation of centralized health care measures with the application of the state assessment of medical technologies (HTA)” [30] there is a need to update the National List of Basic Medicines; lists of medicines purchased from the state budget; nomenclature of medical devices and medical devices in the direction of “medicines and medical devices for health care facilities to ensure the treatment of patients with cardiovascular and cerebrovascular diseases”; nomenclature of medicines and MDs reserves in case of emergency situations.

The results of our analysis of the above-mentioned regulatory and legal documents indicate the need to use modern pharmacotherapy of medicines and MDs, provided for by the current legislation that regulates the pharmaceutical provision of medicines to the population of Ukraine. Therefore, there is a need to develop sound socio-economic measures on the basis of HTA pharmaceutical provision of medicines with modern approaches to rational pharmacotherapy.

The analysis of foreign scientific works shows the high interest of Ukrainian and foreign scientists in the use of pharmaco-economically proven rational pharmacotherapy of medicines for the treatment of CVD. The EUROASPIRE IV study conducted in 13 European countries (n=4663) deserves special attention. Accordingly, this study pharmaco-economically proved the effectiveness of using optimized drug pharmacotherapy when using ESC EORP guidelines for the treatment of patients with coronary artery disease [31]. The next EUROASPIRE V study (n=8261) reveals the problems of the influence of stress factors on the quality of life of patients with coronary events according to gender differences [32], the socio-economic level of patients with CVD and the study of access to pharmacotherapy of medicines in countries with different income levels in particular in Ukraine. EUROASPIRE V evidence shows that stress factors and the socio-economic level of patients influence the increase in the number of CVD [33].

The results of the analysis of scientific works from the scientometric databases Scopus, Web of Science, PubMed, MedLine, BMJ, Embase indicate a high interest in the epidemiological state of CVD, which arose in Ukraine

during military aggression. Thus, in the scientific works of American scientists Abhishek Pandey, Chad R. Wells, Valentyn Stadnytskyi, etc. (2023), Navarese, E. P., Grzelakowska, K., Mangini, F. et al. (2022) were highlighted the influence of the factors of military aggression in Ukraine on internally and externally displaced persons, which leads to an increase in CVD and an additional burden on health care systems in European countries. Particular attention is paid to the state of overloading of the healthcare system in Ukraine and the pharmaceutical provision of medicines and medical supplies of Ukrainian citizens in war conditions [34]. The influence of the socio-economic status of the population on cardiovascular risks was paid attention to and considered in an international study by scientists from Great Britain: Emmanuel Sorbets, Kim M Fox, Yedid Elbez and others (2020). Scientists have proven that actions aimed at the prevention of various conditions facilitate the course of CVD [35]. Special attention is paid by Italian scientists Fausto J. Pinto, Massimo F. Piepoli, Roberto Ferrari (2023) to the strategy of treating patients with coronary artery disease using combined therapy; impact of the use of fixed medicines combinations on patients’ adherence to treatment and indicators of the pharmaco-economic efficiency of drug therapy [36]. The impact of continuous care for patients with coronary heart disease under the guidance of clinical pharmacists on patient adherence to treatment and improvement of clinical indicators is discussed in the scientific works of M.J. Östbring (2021, Sweden) [38], Gao, L., Han, Y., Jia, Z, et al. (2023) [37].

Domestic scientists have studied the impact of war stressors on the epidemiological indicators of cardiovascular disease in the population of Ukraine [38], modern evidence-based principles of pharmacotherapy of cardiovascular diseases [39], the availability of statin therapy for citizens of Ukraine [40], the available range of medicines used in arterial hypertension, medicines’ support for patients with acute cerebrovascular disorders. Special attention should be paid to the analysis of the regulatory and legal basis of the pharmaceutical provision of the population of Ukraine under martial law, conducted by Ukrainian researchers P. Oliinyk, I. Chukhrai, and S. Oliinyk (2023). Scientists have proven that the state regulation of the pharmaceutical provision of both health care institutions and the Ukrainian population with affordable medicines and MDs requires significant improvement of all structural units, taking into account the principles of state management. N. Khanyk, B. Hromovyk, O. Levytska and others raise the issue of effective pharmaceutical supply of medicines and MDs to the Ukrainian population and their proper use in the conditions of military operations (2022). The authors focus on the post-war pharmaceutical provision of pharmacotherapy and MDs to support the long-term treatment of patients with chronic conditions, in particular CVD, in the long-term perspective of the recovery of Ukraine [4]. Equally important are the issues of introducing the basic principles of hospital HTA into the health care system for the further adoption of important political decisions in the pharmaceutical supply of medicines and MDs.

Our further scientific research is aimed at studying the impact of the prevalence of CVD, in particular coronary artery disease, on the quality and effectiveness of pharmaceutical support with pharmacotherapy of the Ukrainian population under martial law. The structure of mortality from CVD attracts special attention. Data from global websites of international organizations show that in the world ranking, strokes take first place after acute and chronic coronary artery disease. However, in Ukraine by 2021, the opposite trends towards premature mortality from CHD, disability and morbidity of the adult population are observed, which leads to significant losses in the country's economy, as well as an additional burden on the health care system.

According to the results of the analysis of scientific works Daponte-Codina, A., Knox, E. C., Mateo-Rodriguez, I. (2022) and others, we found out that in European countries, mortality from CAD makes up 20% of all mortality in Europe and ranks first among all CVDs. According to ESC data for 2017 in European countries, the mortality rate for all age groups from CAD among women was 18% and men – 17%. The premature mortality rate for all age groups from CAD in European countries was 11% for women and 15% for men.

Thus, in European countries, there is a general tendency to decrease the mortality rate of the population from CAD. It should be noted that after 2025 the aging of the population is expected and an increase in mortality from CAD is predicted. Therefore, the main efforts in the world and in European countries are aimed at preventing the development of CVD, in particular at the elimination of risk factors for the occurrence of CAD and actions aimed at primary, secondary and tertiary prevention of CVD.

Therefore, the use of modern pharmacotherapy for coronary artery disease in clinical practice, proposed by the ESC, has a positive effect on the reduction of morbidity, further disability of the population and the budget of the European healthcare system. The redistribution of pharmaco-economically justified priorities in the pharmaceutical supply of medicines and MDs in accordance with the annually updated clinical recommendations in European countries significantly improves the population's access to modern, effective and safe medicines and MDs. Modern methodological approaches to the pharmaceutical supply of medicines and MDs based on the principles of HTA, provide a basis for making quick and effective decisions in health policy.

Important attention in the European Union (EU) countries is paid to the influence of social factors. The results of our analysis of literary sources of medical databases indicate the negative influence of socio-economic and psycho-social risk factors on the increase in the number of coronary artery disease, the influence of which increases in the conditions of military conflicts. Other scientific studies conducted by foreign scientists Stolpe, S., Kowall, B., & Stang, A. (2021) indicate the impact of primary and secondary prevention of CAD, modern diagnostic methods and rational pharmacotherapy of medicines on reducing the mortality rate in European countries.

In EU countries, special attention is paid to the influence of behavioral and metabolic factors on the risk of CVD. The

scientific works of Christian Albus (2010), Valtorta NK, Kanaan M, Gilbody S (2016) reflect the results of research on the effects of smoking, alcoholism, the presence of trans fats and salt in food, a sedentary lifestyle, low socioeconomic status, depression, anxiety, stress at work and in the family, social isolation to increase the incidence of CVD. Therefore, the main efforts of researchers are aimed at developing actions to eliminate behavioral and metabolic risk factors for CVD.

Foreign scientists proved that the pandemic caused by the SARS-CoV-2 virus had a separate effect on the increase in the incidence of CVD. The factors of a sedentary lifestyle, social isolation and significant work overload associated with the transition to a remote form of work and study were added to the above factors.

Our comparative analysis of the Global Burden of Disease from 1990 to 2019 (mortality rates per 100,000 population and the DALYs index (disability-adjusted life years)) from CVD and CAD in Eastern European countries and in Ukraine shows negative trends toward an increase mortality rate in Ukraine (Fig. 1). Thus, we observe that starting from 2005 the indicators of the DALYs index began to decrease in the countries of Eastern Europe. While in Ukraine these indicators decreased at a slower pace until 2014, and starting from 2015 they had positive trends. We can assume that the war started (2014) had a negative impact on the increase in the death rate and the DALYs index in Ukraine; psycho-social aspects; increase in behavioral, metabolic, environmental and socio-economic factors influencing the occurrence of cardiovascular events. During the last 2 years before the war, the COVID-19 pandemic led to a sharp increase in the mortality of the population from CAD.

CAD is considered a costly disease in the world. Thus, according to estimates, the cost of the economic burden of CHD in EU countries in 2021 amounted to 282 billion per year. Long-term care is estimated separately, which amounts to 155 billion euros per year, which is 55% of the burden of CAD, respectively, 11% of the costs of health care and 11% of the pharmaceutical support of LZ and CF. At the same time, the costs of informal care for patients with coronary artery disease make up 28% (78 billion euros per year). On average, 630 euros are spent on the treatment of one patient with coronary artery disease in EU countries (Table 1), which ranks first in the treatment of all CVDs [42].

This situation requires modern approaches to the use of rational pharmacotherapy based on the evidence and principles of HTA in the Ukrainian health system and requires further improvement of processes in the pharmaceutical supply of medicines and MDs to provide better access to drugs for patients with CVD in the country.

Thus, we observe the highest costs for patient per year for the treatment of CAD in Germany (€903) and Austria (€831). But the lowest costs for treating a patient with coronary artery disease are in Cyprus (381 euros).

In Ukraine, according to the document "Some issues of the implementation of the program of state guarantees of medical care for the population in 2023", the tariffs for medical services did not include the costs of medicines

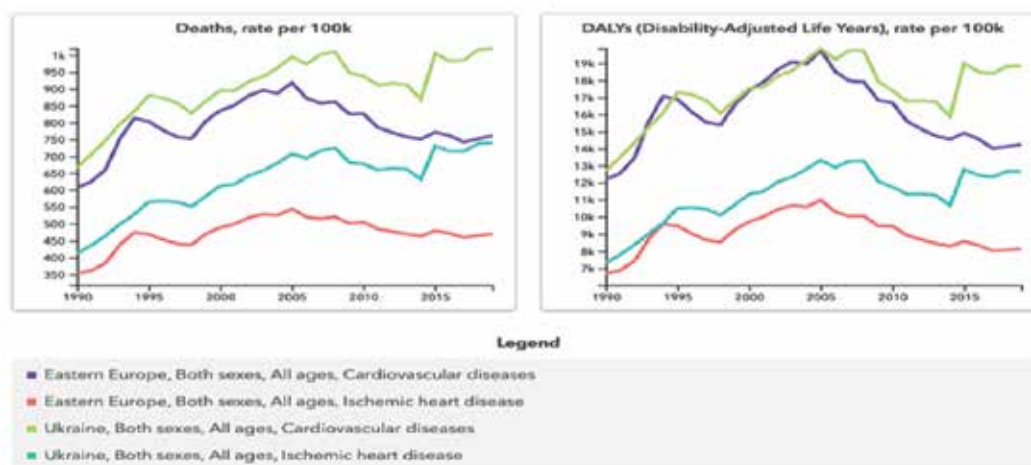


Fig. 1. Comparative analysis of mortality rates and the DALYs index in Ukraine and Eastern European countries [41]

Table 1. Costs per year for the treatment of CAD in EU countries, euros (2021) [42]

EU country	Costs, euro	EU country	Costs, euro
Germany	903	Spain	535
Austria	831	Belgium	529
Lithuania	745	Estonia	521
Italy	726	France	520
Czech Republic	652	Bulgaria	517
Netherlands	643	Latvia	516
Romania	637	Luxembourg	502
Finland	636	Greece	491
Slovenia	585	Slovakia	447
Poland	578	Portugal	428
Ireland	574	Croatia	421
Hungary	572	Malta	407
Norway	563	Cyprus	381
Sweden	536		

and MDs, consumables, which should be “provided in a centralized manner at the expense of other state budget programs”. Therefore, the cost of medicines used to treat patients with coronary artery disease must be added to the tariffs indicated below. Thus, taking into account the current socio-economic condition of the population of Ukraine in the conditions of war, access to effective, safe medicines and medical devices is deteriorating. According to the above-mentioned document, the rate for a treated case of medical assistance for an acute myocardial infarction with stenting is UAH 43,573; the rate for a treated case without stenting is UAH 25,261 for an acute myocardial infarction [40].

Therefore, according to the above-mentioned current legislation, health care facilities can provide, at the expense of other programs of the state budget, not all drugs and MDs, which are related to the prescribed rational

pharmacotherapy of medicines. A significant part of the costs of CAD treatment falls on the patient’s budget. Accordingly, this situation requires a review from the HTA point of view of the nomenclature of the National List of Basic Medicines; lists of pharmaceuticals purchased from the state budget; nomenclature of medicines and medical devices in the direction of “medicines and medical devices for health care facilities to ensure the treatment of patients with cardiovascular and cerebrovascular diseases”; nomenclature of medicines and MDs reserves in case of emergency situations on the basis of HTA.

The results of a comparative analysis of the Global Burden of Disease and the DALY index [40], as well as the mortality rates of the population of Ukraine by year from CVD, in particular from CAD [42] indicate a dynamic increase in the number of deaths in Ukraine, starting from 2020 (Fig. 2), which due to the influence of behavioral, metabolic,

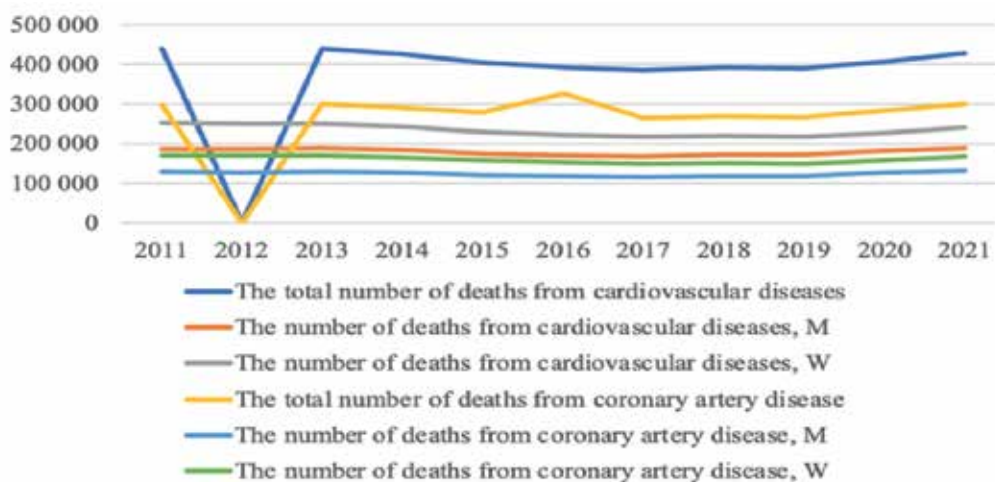


Fig. 2. Total mortality of the population of Ukraine by year, including CVD and CAD [40]

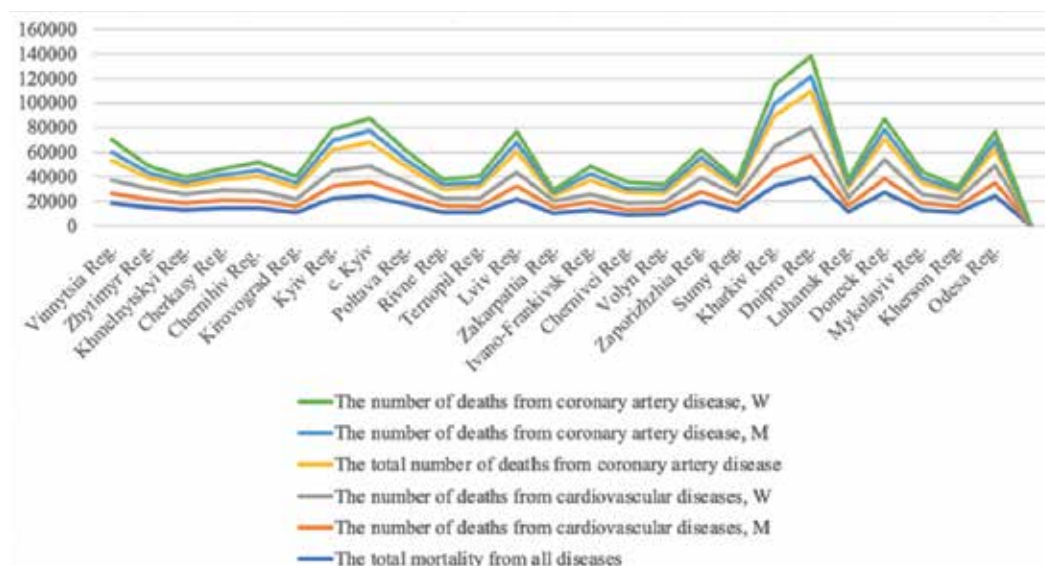


Fig. 3. Mortality from CVD in the year from CAD in the regions of Ukraine for 2021 [40]

environmental and socio-economic risk factors for the occurrence of CVD, in particular CAD.

According to the data of the State Statistics Service of Ukraine, the number of deaths from CVD in 2021 amounted to 429,291 lives, including 300,406 deaths from coronary heart disease [57]. As noted by foreign scientists, the mortality rate from HSC during this period was 800 lives per 100,000 men and 1,000 lives per 100,000 women in Ukraine. For comparison, in European countries with a high level of income, the mortality rate among men is 328 lives per 100,000 population, and among women – 311 lives per 100,000 population. In European countries with an average level of income, mortality from CVD among men is 449 lives per 100,000 population and among women – 458 lives per 100,000 population [35].

We found out that the distribution of the number of deaths by region of Ukraine depends on the population size in administrative-territorial units (Fig. 3). Kharkiv and

Dnipropetrovsk regions have the largest share of population mortality, followed by Kyiv and Kyiv, Donetsk, Odesa, and Lviv regions.

Of scientific interest are the electronic analytical data of the National Health Service of Ukraine (NHSU) regarding the statistics of the creation of medical conclusions about the temporary incapacity of specialized care in the specialities of cardiologist, interventionalist, cardiovascular surgeon in the category of disease or injury of a general nature (Fig. 4). Data on the size of the Ukrainian population at the beginning of the war, which amounted to 41.1 million people, should also be taken into account. According to UN data, as of November 28, 2023, there are 6,319.7 thousand people abroad, which is 15.4%. Hypothetically, the increase in the number of appointments can be explained by the increase in the number of patients with exacerbations of coronary artery disease as a result of the increase in the main risk factors for the occurrence of CVD.

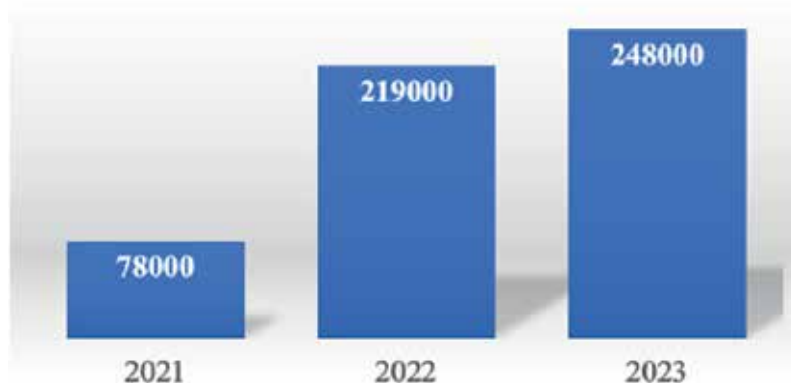


Fig. 4. Statistics of quantity of medical conclusions about the temporary incapacity of specialized medical care to the speciality of a cardiologist in the category of disease or injury of a general nature [41]

Thus, the increase in the number of appointments of patients with coronary artery disease for specialized medical care during martial law increases the need for medicines and MDs, which are used in rational pharmacotherapy.

CONCLUSIONS

1. As a result of the study, socio-economic factors that affect the state of pharmaceutical care for patients with CVD (in particular, coronary artery disease) were determined: the economic crisis in the country; population density by administrative and territorial regions; the number of requests for specialized medical care; access of the population to drugs, medicine and medical care; regulatory and legal security of the pharmaceutical care process; the cost of the disease; the level of mortality and morbidity by gender and age; stressogenic factors of war; state of mental health of the population of Ukraine; consequences of the pandemic caused by the SARS-CoV-2 virus.
2. In this study, among the specified socio-economic factors, the most attention is drawn to the need to update the regulatory and legal security of the pharmaceutical care process, namely: the use of substantiated and pharmacoeconomically proven ESC pharmacotherapy of medicines; the need to update the National List of Basic Medicines; lists of medicines purchased by means of the state budget; nomenclature of medicines and medical devices in the direction of "medicines and medical devices for health care facilities to ensure the treatment of patients with cardiovascular and cerebrovascular diseases"; nomenclature of medicines and MDs reserves in case of emergency situations on the basis of HTA.
3. It was found out that the list of medicines proposed for the pharmacotherapy by the "Unified clinical protocol of primary, secondary (specialized) and tertiary (highly specialized) medical care "Stable coronary artery disease" and the list of medicines offered for reimbursement under the program of state guarantees medical care of the population needs an appro-

priate review by developing sound economic and methodological principles based on the guidelines of the HTA.

4. The pharmacoeconomic advantage of the proven effectiveness of the use of optimized pharmacotherapy when using the ESC EORP guidelines for the treatment of patients with coronary artery disease based on the HTA obtained by the European studies EUROASPIRE IV and EUROASPIRE V was established.
5. It was determined that the use of modern pharmacotherapy for coronary artery disease in clinical practice, proposed by the ESC, has a positive effect on the budget of the health care system. The redistribution of priorities in the pharmaceutical supply of medicines and MDs in accordance with the annually updated clinical recommendations in European countries significantly improves the population's access to modern, effective and safe medicines and MDs. Modern methodological approaches to the pharmaceutical supply of medicines and MD, based on the principles of the HTA, create the basis for making quick and effective decisions in health policy.
6. The use of modern approaches to rational pharmacotherapy based on the principles of the HTA in the Ukrainian health care system is analyzed. The situation requires further improvement of the processes in the pharmaceutical supply of medicines and MDs to provide better access of the country's population with CVD to medicines.

Thus, the listed measures can lead to an improvement in the state of pharmaceutical supply of medicines and MDs of patients with CVD (in particular, coronary artery disease), affect the saving of budget funds in health care and improve the epidemiological situation of CVD in Ukraine.

We see the development of substantiated methodological approaches of socio-economic measures on the basis of the HTA as a perspective for further research and harmonization of Ukrainian state policy in the field of pharmaceutical supply of medicines and provision of quality pharmaceutical care to patients with CVD.

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ORCID AND CONTRIBUTIONSHIP

Natalia A. Bilousova: 0000-0001-6732-426X **A B D E F**

Vasyl M. Mykhalchuk: 0000-0002-5398-4758 **E F**

CONFLICT OF INTEREST

The Authors declare no conflict of interest.

CORRESPONDING AUTHOR

Natalia A. Bilousova

Shupyk National Healthcare University of Ukraine

9 Dorohozhitska St., 04112 Kyiv, Ukraine

e-mail: arinatala@gmail.com

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