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ABSTRACT

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THE EFFECTIVENESS OF THE UKRAINIAN HEALTHCARE SYSTEM IN THE PREVENTION OF CARDIOVASCULAR DISEASES IN CONDITIONS OF MILITARY OPERATIONS: AN ANALYTICAL REVIEW

Introduction. The full-scale war in Ukraine has created unprecedented challenges for the healthcare system and significantly worsened the cardiovascular health of the population. The sharp increase in stress levels, the displacement of millions of people, the destruction of medical infrastructure, and limited access to treatment have led to an increase in the burden of cardiovascular diseases (CVD). This study examines the main consequences of the war for the Ukrainian public health system in the context of CVD and identifies areas for its adaptation and recovery.

Methods. The work is based on the analysis of national statistical reports, documents of the WHO, the World Bank, the ICRC and the Ministry of Health of Ukraine for 2022–2024. Comparative analysis, content analysis of strategic documents and SWOT analysis were used to identify the strengths and weaknesses of the system, its opportunities and threats in the context of prevention and treatment of CVDs.

Results. It was found that the destruction of more than 900 medical institutions, the death and migration of personnel, the lack of medicines and the psychological exhaustion of the population became key factors in the increase in cardiovascular risk. Despite this, the system retained its basic functions thanks to the development of telemedicine, mobile clinics and eHealth platforms, which allowed for to support of the provision of emergency care and monitoring of chronic diseases. SWOT analysis revealed strengths (digitalisation, international support) and main threats (economic instability, emigration of personnel).

Discussion. The results obtained indicate that the restoration of the public health system should be based on the principles of sustainability and the integration of CVD prevention into national post-war development strategies. Further strengthening of the primary care, the

development of intersectoral partnerships and stable financing are necessary conditions for reducing CVD mortality and increasing the resilience of the system in the conditions of a prolonged crisis.

Keywords: cardiovascular diseases; war; Ukraine; public health; resilience; NCD prevention; healthcare system restoration.

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ЕФЕКТИВНІСТЬ СИСТЕМИ ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ В ПРОФІЛАКТИЦІ СЕРЦЕВО-СУДИННИХ ЗАХВОРЮВАНЬ В УМОВАХ ВОЄННИХ ДІЙ: АНАЛІТИЧНИЙ ОГЛЯД

Вступ. Повномасштабна війна в Україні створила безпрецедентні виклики для системи охорони здоров'я та значно погіршила серцево-судинне здоров'я населення. Різке зростання рівня стресу, переміщення мільйонів людей, руйнування медичної інфраструктури та обмежений доступ до лікування призвели до збільшення тягаря серцево-судинних захворювань (ССЗ). У цьому дослідженні розглядаються основні наслідки війни для української системи охорони здоров'я в контексті ССЗ та визначаються напрямки для її адаптації та відновлення.

Методи. Робота базується на аналізі національних статистичних звітів, документів ВООЗ, Світового банку, МКЧХ та Міністерства охорони здоров'я України за 2022–2024 роки. Для визначення сильних та слабких сторін системи, її можливостей та загроз у контексті профілактики та лікування ССЗ було використано порівняльний аналіз, контент-аналіз стратегічних документів та SWOT-аналіз.

Результати. Було виявлено, що руйнування понад 900 медичних закладів, смерть та міграція персоналу, брак ліків та психологічне виснаження населення стали ключовими факторами зростання серцево-судинного ризику. Незважаючи на це, система зберегла свої основні функції завдяки розвитку телемедицини, мобільних клінік та платформ електронної охорони здоров'я, що дозволило підтримувати надання невідкладної допомоги та моніторинг хронічних захворювань. SWOT-аналіз виявив сильні сторони (цифровізація, міжнародна підтримка) та основні загрози (економічна нестабільність, еміграція персоналу).

Обговорення. Отримані результати свідчать про те, що відновлення системи охорони здоров'я має базуватися на принципах сталості та інтеграції профілактики серцево-судинних захворювань у національні стратегії післявоєнного розвитку. Подальше зміцнення первинної медичної допомоги, розвиток міжсекторальних партнерств та стабільне фінансування є необхідними умовами для зниження смертності від серцево-судинних захворювань та підвищення стійкості системи в умовах тривалої кризи.

Ключові слова: серцево-судинні захворювання; війна; Україна; громадське здоров'я; стійкість; профілактика неінфекційних захворювань; відновлення системи охорони здоров'я.

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LIST OF ABBREVIATIONS

CVD – Cardiovascular disease
 NCD – Noncommunicable disease
 NCDs – Noncommunicable diseases
 PH – Public health
 MOH – Ministry of Health (of Ukraine)
 WHO – World Health Organisation
 ICRC – International Committee of the Red Cross
 IOM – International Organisation for Migration
 UNDP – United Nations Development Programme
 EU – European Union
 ESC – European Society of Cardiology

URC – Ukraine Recovery Conference
 RDNA4 – Fourth Rapid Damage and Needs Assessment
 HALE – Healthy life expectancy
 COVID-19 – Coronavirus disease 2019
 eHealth – Electronic health system
 PHC – Primary health care
 DTM – Displacement Tracking Matrix
 GDP – Gross domestic product
 SWOT – Strengths, Weaknesses, Opportunities, Threats

INTRODUCTION

Cardiovascular diseases (CVD) have been the leading cause of death in Ukraine for the past decades. Before the full-scale invasion of the Russian Federation in 2022, Ukraine already had one of the highest mortality rates from cardiovascular diseases in Europe. According to pre-war estimates published by the European Society of Cardiology (ESC), the mortality rate from cardiovascular disease (CVD) in Ukraine before the war was about 800 cases per 100,000 among men and 1,000 per 100,000 among women. For comparison, in high-income European countries these figures were 328 and 311 per 100,000, and in middle-income countries, 449 and 458 per 100,000, respectively [1].

By 2022, Ukraine was already facing an “epidemic” of noncommunicable diseases (NCDs, with CVDs making the largest contribution (67%) [2].

The COVID-19 pandemic further exacerbated the risks by limiting access to routine health services, postponing preventive examinations, and increasing the prevalence of malnutrition and psycho-emotional disorders, which are significant risk factors for the development of arterial hypertension and coronary heart disease. In addition, COVID-19 has been shown to be associated with cardiovascular complications [3].

The outbreak of a full-scale war in 2022 led to even deeper structural challenges to the health care system. Since the outbreak of a full-scale war in 2022, according to the State Statistics Service of Ukraine, over 82% of all deaths were caused by non-communicable diseases (NCDs), of which 64% were due to cardiovascular diseases (CVDs). In 2021, the share of deaths caused by NCDs also exceeded 78%, of which over 60% were CVDs [4].

As of 2025, a total of 2,176 assaults on healthcare infrastructure were recorded, leading to damage or destruction of 910 hospitals and the deaths of 262 health workers [5].

According to estimates by the International Organisation for Migration (IOM), the war led to the mass internal migration of 3,7 million people, and even more – 6.7 million people migrated abroad. (International Organisation for Migration (IOM), 2024. Displacement Tracking Matrix (DTM) Ukraine: General Population Survey Round 17, August 2024. Geneva: IOM).

Therefore, a full-scale war has led to the vulnerability of the healthcare system, which is primarily designed to ensure the prevention of non-communicable diseases and monitor the health of the population. The shift in focus towards emergency care has led to a depletion of human resources and funding, which in turn has led to the interruption of programmes for the prevention, diagnosis and treatment of noncommunicable diseases, including coronary heart disease, stroke and cancer [6].

At the same time, the system has demonstrated elements of resilience, thanks to digitalisation (eHealth system, telemedicine services), mobile teams and international assistance (WHO, ICRC, UNDP). However, the scale of these measures does not yet compensate for the overall decrease in preventive capabilities.

Thus, in the context of ongoing hostilities, a relevant task is to assess the effectiveness of the Ukrainian public health system in the context of cardiovascular disease prevention, with a focus on structural, personnel and organisational aspects that determine its stability and effectiveness during the crisis period.

PURPOSE AND OBJECTIVES

The purpose of this study is to conduct an analytical assessment of the effectiveness of the public health system of Ukraine in the context of cardiovascular disease (CVD) prevention during hostilities, to identify key challenges, mechanisms of resilience, and directions for restoring preventive functions after the end of the war.

To achieve this goal, we have analysed modern scientific and political approaches to CVD prevention in the public health system; characterised structural, personnel, and organisational changes in the Ukrainian healthcare system caused by the war; and identified the main factors affecting the resilience of the public health system in crisis conditions. Besides that, a SWOT analysis of the Ukrainian public health system in the context of noncommunicable disease prevention was conducted [7]. Finally, we formulated strategic directions for strengthening CVD prevention in the post-war period, with a focus on personnel stability, digitalisation, and integration of preventive services into national recovery programs.

RESEARCH METHODS

The study was conducted in the format of an analytical and review study aimed at a comprehensive assessment of the state of the public health system of Ukraine in the prevention of cardiovascular diseases (CVD) in the context of a full-scale war in 2022–2025.

Methodologically, the study is based on a systemic, interdisciplinary approach to public health analysis, which combines medical and social, administrative and political aspects. The basis is the concept of resilient health systems [8, 9], which presents a sustainable healthcare system that is able to adapt and maintain basic functions and recover after crises.

The analytical part of the study was based on the official reports of the Ministry of Health of Ukraine for 2022 and 2023 [10, 11], which contain information on staffing, the structure of medical institutions, the state of the bed fund, outpatient clinic attendance and the intensity of hospitalisations; World Health Organisation analytical documents on the impact of war on the health system and recommendations on PH sustainability [8, 12, 13, 14]; Country profiles and CVD mortality statistics before the war by European Society of Cardiology [1]; International Committee of the Red Cross (ICRC) report on the state of medical infrastructure and access to care [15]; Demographic consequences of population migration by International Organisation for Migration (IOM) [16, 17]; Public health network support initiatives United Nations Development Programme (UNDP) [18, 19]; Scientific publications and policy documents that describe the consequences of war on NCDs, especially CVD [2, 5, 6, 9, 20].

A content analysis was carried out and applied to regulatory legal acts and strategic documents of Ukraine in the field of public health, in particular, National Public Health Strategy of Ukraine for the period until 2030 [21], the Action Plan to Combat Non-Communicable Diseases [22], and eHealth programs and initiatives were analysed. The analysis allowed us

to identify the evolution of approaches to CVD prevention, the degree of their integration into PH policy and gaps in implementation. Documentary analysis and thematic generalisation were carried out on the basis of official reports of international organisations (WHO, ICRC, IOM, UNDP) concerning the impact of the war on the healthcare system, migration processes and the population's access to basic medical services.

Analytical interpretation included generalisation of trends and formulation of conclusions on the effectiveness of the PH system in ensuring the prevention of CVDs without the use of quantitative analysis.

Besides that, a comparative analysis was used to compare the pre-war and wartime state of the PH system in terms of structural, personnel and functional characteristics. Particular attention was paid to the dynamics of personnel potential, attendance, financing and institutional sustainability.

SWOT analysis was conducted to identify the strengths and weaknesses of the PH system, opportunities and threats in the context of CVD prevention. This method allowed us to structure strategic directions for improving the system.

Limitations

Due to martial law and the lack of open data on mortality by cause after 2021, quantitative analysis is limited. However, a comprehensive analysis of official, international and scientific sources allowed for the creation of a reliable assessment of trends and the identification of key problem areas.

RESEARCH RESULTS AND DISCUSSION

General characteristics of the pre-war situation

Before the full-scale invasion of 2022, Ukraine remained a country with a high burden of non-communicable diseases (NCDs), particularly cardiovascular diseases (CVDs), which were the leading cause of mortality in the population. Life expectancy in Ukraine was 66 years for men and 76 years for women, which was one of the lowest in Europe [22, 23]. About 84–91% of all deaths were due to NCDs, of which 60–67% were due to CVDs [24, 25]. According to an analysis by the World Health Organisation, the main causes of premature death were ischemic heart disease, strokes, cirrhosis, chronic lower respiratory diseases, and self-harm [26].

According to the results of the WHO STEPS 2019 study, conducted by the Ministry of Health of Ukraine in collaboration with WHO, the prevalence of the main risk factors for NCDs was extremely high [25, 26]. Smoking is reported by 33.9% of the adult population, of which 50.3% are men, and 16.7% are women. Another significant factor is excessive alcohol consumption, namely, 55.6% of the adult population reported drinking alcohol in the last 30 days. Failure to comply with WHO

dietary recommendations led to insufficient consumption of fruits and vegetables in 66.4% of the Ukrainian population. In addition, 59.0% of adults were overweight, and 24.8% were obese. 34.8% of the population suffered from high blood pressure, and 40.7% from high total cholesterol. 7.1% had elevated fasting glucose levels, and 10% of adults had low physical activity. In addition to high rates of individual factors, almost a third of the Ukrainian adult population (32.8%) had a combination of three or more risk factors.

In 2018, the Government of Ukraine approved the National Action Plan for Non-Communicable Diseases [22], which provided for interagency cooperation for the prevention of CVD, diabetes, cancer and chronic respiratory diseases. However, the implementation of the plan was partially limited due to insufficient funding, staff shortages, and fragmentation of programs, as evidenced by the analytical sections of the Healthcare Development Strategy until 2030 [21].

At the same time, the primary health care reform introduced by the Law “On State Financial Guarantees of Medical Care for the Population” [27] created the prerequisites for strengthening prevention, but in practice, the emphasis remained on the treatment of acute conditions and infectious diseases, in particular, COVID-19 and influenza, while NCDs remained a secondary direction [21, 24, 25].

As of 2019–2021, Ukraine had a population of about 44 million people, of whom 69.5% lived in cities. The country was characterised by an ageing population, low birth rates, and high levels of premature mortality among working-age people. The average healthy life expectancy (HALE) was only 63.6 years, which is below the EU average [23].

Thus, the pre-war period (2018–2021) was characterised by a high level of cardiovascular mortality, the prevalence of risk factors, insufficient interdepartmental coordination in the prevention of NCDs, and limited funding for primary prevention. Despite the adoption of several strategic documents, such as the National PH Strategy until 2030 [21], the NCD Action Plan 2018 [22], the Medical Guarantees Program [27], the real impact on the level of CVD remained limited, which became one of the factors of the system's vulnerability in war conditions.

Impact of full-scale war on the public health system

The full-scale war has dramatically worsened the cardiovascular health of the Ukrainian population, both through direct destruction of the medical infrastructure and through indirect social, economic and psychological consequences. Even by 2022, the share of deaths from circulatory system diseases exceeded 60% of all fatalities, which amounted to more than 700 thousand people each

year [4]. According to official data from the Ministry of Health of Ukraine, in 2021, mortality from ischemic heart disease increased by 15.5% compared to 2017, and this trend continues, intensifying due to the consequences of the war [10].

With the beginning of the full-scale invasion in February 2022, the healthcare system was forced to effectively curtail routine medical care, including cardiology, and refocus resources on treating the wounded and emergencies. This led to a decrease in the number of preventive examinations, blood pressure monitoring, and rehabilitation after heart attacks and strokes. Data from the Centre for Public Health confirm a sharp reduction in primary prevention and the lack of stable monitoring of arterial hypertension indicators in most regions in 2022–2023 [2, 11].

The large-scale destruction of medical infrastructure has sharply reduced access to cardiology care. According to the World Bank, by the end of 2024, more than 910 hospitals, including departments providing thrombolysis and percutaneous coronary interventions, were damaged or destroyed [18]. In frontline and occupied regions, access to emergency care for acute cardiovascular events remains minimal, and patient evacuation is complicated by the lack of transport and safe routes.

Clinical observations in 74 Ukrainian hospitals showed that the volume of rehabilitation services after heart attacks decreased from 50% to 36%, and routine diagnostics almost halved [5]. Doctors note a chronic shortage of personnel and an increase in the load on emergency departments. According to official statistics from the Ministry of Health, the number of doctors in Ukraine decreased from 35.1 to 32.5 per 10,000 population between 2021 and 2023, and the number of positions filled by individuals fell to 79.4%. The number of cardiologists in the general structure of doctors is only 1.9%, and this figure continues to decline, especially in Donetsk, Luhansk and Kherson regions, where the shortage of medical personnel exceeds 40% [11].

At the same time, energy attacks and mass blackouts have created a new risk factor for patients with CVD. Power outages made it impossible to operate cardiac monitoring and cardiac support devices, which increased the risk of death among heart failure patients. A particularly sharp increase in hospitalisations was noted in the winter months of 2023–2024, when cold weather and power outages were observed simultaneously [18].

The impact of the war on cardiovascular mortality is exacerbated by changes in the demographic structure of the population. According to the Ministry of Health in Ukraine, the share of people aged 65 and older is 17%, and the share of women in this age group is over 21% [10]. Demographic ageing, combined with mass emigration of young people, increases the proportion of

patients with high cardiovascular risk and reduces the potential of labour resources in the medical field. The decrease in the availability of medical care against the background of an ageing population creates a “double pressure” on the system: an increase in the number of people with CVD and a decrease in the number of specialists able to treat them.

The psychosocial consequences of the war have become another powerful factor in cardiovascular risk. A 2024 IOM survey showed that 63% of Ukrainians experience chronic stress, and 38% symptoms of depression [16, 17]. Constant anxiety contributes to increased blood pressure, heart rhythm disturbances, and an increase in the frequency of acute events. Added to this is the worsening socio-economic situation: the poverty rate increased from 20.6% in 2021 to 35.5% in 2023, which reduces the population's ability to regularly purchase antihypertensive drugs [16, 17].

The internal displacement of millions of Ukrainians has disrupted the continuity of care for patients with CVD. As of 2024, Ukraine had an estimated 3.7 million internally displaced persons and 4.2 million returnees, putting a strain on healthcare facilities in the western and central regions [16, 17, 19].

And finally, according to WHO estimates, about 70% of primary care facilities reported a lack of resources for blood pressure control and monitoring of CVD patients [14, 28].

Thus, the full-scale war has exposed the structural vulnerability of the Ukrainian healthcare system in the area of cardiovascular disease control. The destruction of hospitals, the shortage of cardiologists, the deterioration of living conditions and the spread of chronic stress form an interconnected system of risks, in which each factor reinforces the other. The changing demographic profile of the population, the decline in the level of provision of medical personnel and the interruption of therapy form the prerequisites for a further increase in mortality from ischemic heart disease and strokes in the post-war period

Elements of system resilience and adaptability

The war demonstrated that the resilience of a public health system is determined not only by the availability of resources, but above all by its ability to maintain functionality in crisis conditions. Ukraine has effectively passed the test of practical implementation of the principles outlined in the WHO framework documents on strengthening health systems [8, 9, 29].

The basis of post-war recovery has become primary health care, which ensures control of blood pressure and CVD risk factors even in war conditions. According to the WHO, mobile clinics, telemedicine and integration of NCD prevention into humanitarian programs have become key tools for maintaining access to care [14].

According to the global principles of post-war recovery [12], the goal is not to return to the pre-war structure, but to build a flexible, digital and integrated system capable of responding quickly to crises. A key area of adaptation has been improving financing. The Law of Ukraine “On State Financial Guarantees of Health Care for the Population” [27] laid the foundation for ensuring a guaranteed package of services, including cardiological care, even under limited budgets. The Health Strategy 2030 [21] provides for the integration of CVD prevention into all levels of health care, the expansion of electronic registries and the standardisation of treatment protocols.

International documents, namely WHO Priorities for Health System Recovery 2023 [13] and RDNA4 2025 [18], identified three strategic areas for increasing resilience: 1) strengthening the primary care system for NCD management; 2) staff stability and distance learning; 3) digital monitoring through STEPS and electronic medical records [24, 25]. Despite the war, more than 80% of primary care centres continued to operate, and 60% used telemedicine [28]. The ICRC provided patients with antihypertensive drugs and supported remote counselling [15].

UNDP, together with the Ministry of Health, is developing e-governance and training platforms, which have allowed data on hospitalisations and mortality from CVD to be preserved even in devastated regions [19].

A shift in focus from a reactive to a preventive model is gradually taking shape, within which CVD prevention is integrated into all state policies: environmental protection, urban planning, and education [12, 21]. This is in line with the recommendations of the European Society of Cardiology, which emphasises the leading role of risk factor control [1].

Intersectoral cooperation has become an important factor in resilience. The concept of recovery presented at the Ukraine Recovery Conference Framework 2023 emphasises the involvement of communities and local governments in healthcare management. Such decentralisation makes the system more flexible and closer to patients with chronic diseases.

According to the WHO and the World Bank, a resilient system should combine predictability, flexibility, integration, inclusiveness and sustainable financing [8, 12]. In the context of CVD, this means creating a continuous patient journey from hypertension detection to rehabilitation after a heart attack, regardless of the state of the infrastructure.

Thus, the Ukrainian public health system is gradually moving from the survival stage to the stage of sustainable transformation, where the prevention and

control of cardiovascular diseases become the core of recovery. The synergy of national strategies and international principles forms the basis for building a digital, integrated and socially oriented health system capable of preventing the consequences of future crises (Table 1).

Table 1: Key Directions for Strengthening the Resilience of Ukraine's Public Health System in the Context of Cardiovascular Diseases after 2022

Strategic direction	Practical implementation in Ukraine
Strengthening the primary care system	Mobile clinics, telemedicine, integration of NCDs into crisis response
Staff stability	Distance learning, clinical mentors, support from WHO and UNDP
Digital monitoring	Use of STEPS, electronic medical records, eHealth platform

SWOT analysis of the effectiveness of the PH system in CVD prevention

The above facts indicate that the modern Ukrainian public health system demonstrates a combination of internal strengths and vulnerabilities that shape its adaptive potential in the post-war period.

Strengths include the rapid deployment of digital eHealth services, telemedicine and mobile medical teams, which have ensured continuity of care even in frontline regions. An important advantage is the extensive international support from WHO, UNDP,

ICRC, IOM and other partners, which contribute to the restoration of infrastructure, training of personnel and provision of medicines. Experience in responding to crises, namely the COVID-19 pandemic and war, has strengthened the system's ability to quickly adapt to extraordinary conditions.

Vulnerabilities remain, including the shortage and migration of medical personnel, inequality in access to services between regions, and fragmentation of management and data systems. Insufficient funding for prevention programs, particularly for hypertension control and rehabilitation after heart attacks, hampers the effective response to the burden of cardiovascular diseases.

The post-war period creates opportunities for system modernisation. Measures such as integrating NCD prevention into national recovery plans, developing public-private partnerships, expanding digital monitoring platforms, and international cooperation open up the prospect of creating a more flexible, integrated, and patient-centred model of healthcare.

However, serious threats remain in the form of prolonged hostilities, economic instability, emigration of medical professionals, increasing levels of chronic stress, depressive disorders, and an ageing population, which exacerbates the spread of cardiovascular diseases.

The results of the SWOT analysis are presented in Table 2 and generally indicate that further development of the system should be based on the use of digital and international resources to overcome staffing and financial constraints and ensure equal access to CVD prevention and treatment in all regions of Ukraine.

Table 2: SWOT-analysis of the Resilience of Ukraine's Public Health System in the Context of Cardiovascular Diseases

Internal Factors		
External Factors	Strengths Development of digital eHealth services, telemedicine, mobile teams. International support (WHO, UNDP, ICRC, IOM). Experience in crisis management (COVID-19, war). Preservation of basic PH functions even in frontline regions.	Weaknesses Staff shortages and staff attrition. Inequality of access to PH services between regions. Fragmentation of management and data. Insufficient funding for prevention programs.
	Opportunities Post-war modernization of the PH system. Integration of NCD prevention into national recovery plans. Development of public-private partnerships and digital platforms. Increased international cooperation and grant support.	Threats Prolonged hostilities and economic instability. Emigration of medical professionals. Increased psychosocial stress and depressive disorders. Aging population and increasing burden of NCDs.

CONCLUSIONS. Cardiovascular diseases remain the leading cause of death in Ukraine, and their prevention requires a systemic approach integrated into health policy. Before the start of the full-scale war, there was a gradual increase in the burden of noncommunicable diseases (NCDs), but prevention programs remained fragmented and underfunded.

In addition, the war caused a significant weakening of the preventive link, redistribution of financial and human resources in favor of emergency care and medical evacuation. The destruction of infrastructure, population displacement, increased psychosocial stress and interruption of treatment for chronic diseases became key factors in increasing the risk of CVD complications.

Despite the losses, the health system showed signs of resilience thanks to the development of telemedicine, digitalisation (e-health), mobile medical teams and support from international partners (WHO, UNDP, ICRC, IOM). This allowed to ensure a minimum level of access to essential services and monitoring of the health status of the population even in crisis regions.

Key challenges for the health system include staff shortages, regional disparities in access, limited funding for prevention, and the lack of effective monitoring of NCD outcomes. These factors reduce the effectiveness of prevention interventions and hinder strategic planning.

PROSPECTS FOR FUTURE RESEARCH

A post-conflict recovery strategy should be based on three key areas: 1) rebuilding the health system's human resources capacity through training, motivation, and support for professionals; 2) integrating noncommunicable disease (NCD) prevention into digital health systems, ensuring continuity of cardiovascular disease (CVD) monitoring; and 3) developing national and regional indicators of CVD prevention effectiveness that will allow assessing the impact of CVD programs over time.

Ukraine has real potential to become a model of sustainable health systems for countries experiencing conflict or humanitarian crises. A successful combination of international support, digital innovation, and local initiative can ensure the long-term effectiveness of CVD prevention and reduce NCD mortality in the post-conflict period.

AUTHOR CONTRIBUTIONS

Both authors meet the authorship criteria according to the International Committee of Medical Journal Editors (ICMJE).

Kateryna Zhuk (ORCID: <https://orcid.org/0000-0002-9130-2623>) made a substantial contribution to the conception and design of the study, data acquisition, analysis, and interpretation; drafted the manuscript and was responsible for its intellectual content, structure, and final editing. She approved the final version for publication and agrees to be accountable for all aspects of the work, ensuring the accuracy and integrity of any part of the article.

Vladyslav Smiyanov (ORCID: <https://orcid.org/0000-0002-4240-5968>) provided scientific supervision, contributed to the conceptual framework, interpretation of results, and critical revision of the manuscript for important intellectual content. He approved the final version of the manuscript and agrees to be accountable for all aspects of the work.

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CONFLICT OF INTEREST

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ARTIFICIAL INTELLIGENCE DISCLOSURE

The authors declare that no generative artificial intelligence (AI) tools were used in the research, data analysis, writing, or preparation of this manuscript.

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