# GEORGIAN MEDICAL MEWS

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# ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии საქართველოს სამედიცინო სიახლენი

# **GEORGIAN MEDICAL NEWS**

Monthly Georgia-US joint scientific journal published both in electronic and paper formats of the Agency of Medical Information of the Georgian Association of Business Press. Published since 1994. Distributed in NIS, EU and USA.

GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

# К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

- 1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра. Используемый компьютерный шрифт для текста на русском и английском языках Times New Roman (Кириллица), для текста на грузинском языке следует использовать AcadNusx. Размер шрифта 12. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.
- 2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.
- 3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

- 4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).
- 5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи. Таблицы и графики должны быть озаглавлены.
- 6. Фотографии должны быть контрастными, фотокопии с рентгенограмм в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста в tiff формате.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

- 7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.
- 8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform\_requirements.html В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.
- 9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.
- 10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.
- 11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.
- 12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

# REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

- 1. Articles must be provided with a double copy, in English or Russian languages and typed or computer-printed on a single side of standard typing paper, with the left margin of 3 centimeters width, and 1.5 spacing between the lines, typeface Times New Roman (Cyrillic), print size 12 (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.
- 2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.
- 3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

- 4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.
- 5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles. Tables and graphs must be headed.
- 6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

- 7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.
- 8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform\_requirements.html http://www.icmje.org/urm\_full.pdf
- In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).
- 9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.
- 10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.
- 11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.
- 12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

## ᲐᲕᲢᲝᲠᲗᲐ ᲡᲐᲧᲣᲠᲐᲓᲦᲔᲑᲝᲓ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

- 1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში Times New Roman (Кириллица), ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ AcadNusx. შრიფტის ზომა 12. სტატიას თან უნდა ახლდეს CD სტატიით.
- 2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ,რუსულ და ქართულ ენებზე) ჩათვლით.
- 3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).
- 4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).
- 5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.
- 6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით tiff ფორმატში. მიკროფოტო-სურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სუ-რათის ზედა და ქვედა ნაწილები.
- 7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა უცხოური ტრანსკრიპციით.
- 8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.
- 9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.
- 10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.
- 11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.
- 12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

# Содержание:

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# MEDICAL TOURISM AS A DRIVER OF UKRAINE'S ECONOMIC RECOVERY: PRE-WAR EXPERIENCE AND STRATEGIC GUIDELINES FOR THE POST-WAR PERIOD

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## Abstract.

**Aim:** The purpose of the article is to study the dynamics of medical tourism development in Ukraine in recent years before the full-scale invasion of the Russian Federation, and also to identify the main directions of its recovery in the post-war period.

Materials and methods: The study is based on an interdisciplinary approach that combines legal analysis, economic modeling, and elements of sustainable urban development research. The methodological framework includes systemic-structural and functional-legal analysis of Ukrainian legislation on healthcare, investment policy, and regional development, as well as empirical data on the state of medical tourism in the pre-war period. Analytical methods were used to identify relationships between the development of medical tourism and the resilience of urban environments under crisis conditions.

**Results:** The article analyses examples of successful implementation of public-private initiatives, in particular, the creation of Dnipro Medical Cluster. Particular attention is paid to the consideration of medical tourism as a factor in the formation of economic and legal resilience of Ukrainian cities. It is substantiated that the development of medical tourism has contributed to increasing the resilience of the urban environment to external crises. The article considers new challenges - ensuring access to medical services for internally displaced persons, organisation of rehabilitation of victims, emergence of the phenomenon of forced medical tourism.

Conclusions: The strategic guidelines for the development of medical tourism in the post-war period are proposed. It is concluded that the restoration and development of medical tourism in Ukraine has a double meaning - as an economic tool and as a means of ensuring the sustainability of urban systems in the period of post-war transformation. Implementation of the proposed measures will contribute not only to economic growth, but also to strengthening the resilience of Ukrainian cities as centres of medical, social and investment opportunities.

**Key words.** Healthcare, medical tourism, urban resilience, medical cluster, public-private partnership, investment policy, post-war recovery.

# Introduction.

Over the past decade, Ukraine has demonstrated significant potential in the development of medical tourism, turning individual regions into competitive clusters of healthcare services. Prior to the full-scale invasion of the Russian Federation in 2022, the country was creating conditions for actively attracting foreign patients, developing partnership projects, implementing digital solutions, and creating legislative and institutional preconditions for the sustainable growth of the industry.

Medical tourism was viewed not only as a segment of the tourism market, but also as a tool for improving public health, developing the regional economy, attracting investment, creating new jobs, and strengthening the country's image internationally. In particular, the example of Dnipro Medical Cluster has demonstrated the effectiveness of public-private partnerships in this area. Thus, the development of medical tourism has contributed to strengthening the economic and legal resilience of Ukrainian cities, increasing their ability to adapt to crisis events, ensure the sustainable functioning of medical and social infrastructure, and attract investment in an unstable environment.

Challenges extraordinary caused by circumstances (organisation of counteraction to the COVID-19 pandemic [1-3], ensuring the right to healthcare under martial law [4], etc.) not only suspended a number of initiatives but also led to new social demands, in particular, access to quality medical care for internally displaced persons and the wounded. In this regard, medical tourism has acquired a new dimension - as a forced, socially oriented and strategically important tool for restoring the nation's health in the post-war period. Hence the emergence of numerous scientific publications devoted to certain aspects of medical tourism development. The current scientific debate focuses on the quality and accessibility of medical services [5], complications of access to treatment [6], underdevelopment of medical infrastructure [7], shortage of qualified personnel [8], regulation of prices for medical services for foreigners [9], mechanisms of control and supervision over their provision [10], as well as prevention of violations of patients' rights in this area [11,12].

At the same time, a comprehensive study of the legal, economic and managerial mechanisms for the development of medical tourism in the context of post-war recovery and strengthening the economic and legal resilience of Ukrainian cities has not yet been carried out. Such a gap in the national legal science complicates the formation of an effective policy in this area and hinders the realisation of the potential of medical tourism as a factor of sustainable urban development.

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Therefore, the purpose of this study is to analyse the main achievements in the field of medical tourism in Ukraine before the outbreak of a full-scale war, to identify the main challenges faced by this area in the context of the military conflict, and to substantiate the strategic directions of its recovery and development in the post-war period. Particular attention is paid to the role of medical tourism as a tool for shaping the economic and legal resilience of Ukrainian cities, given its ability to strengthen the local economy, enhance social integration, stimulate investment activity and ensure the sustainability of critical medical infrastructure in times of crisis and reconstruction.

Accordingly, this study seeks to address the following research questions:

- 1. What were the key drivers and characteristics of medical tourism in Ukraine during the pre-war period?
- 2. What strategic indicators and evaluation metrics can be applied to guide the post-war recovery and development of medical tourism?.

# Materials and Methods.

This study adopts an interdisciplinary methodological framework, integrating legal analysis, economic modelling, and the theoretical foundations of urban resilience. Each of these approaches is positioned to examine different yet interrelated aspects of the development of medical tourism in Ukraine before and after the onset of full-scale war.

Legal analysis was employed to assess the national regulatory environment in three key areas: healthcare governance, investment promotion, and urban development. This involved the study of Ukrainian legal acts regulating medical tourism, state support for infrastructure projects, and the legal framework for public-private partnerships. Functional and comparative legal methods were used to determine how current legal mechanisms interact with economic tools to stimulate sectoral development.

Economic modelling was applied to evaluate potential fiscal incentives and investment dynamics, including tax benefits, capital flows, and cost-benefit aspects of public-private initiatives. Statistical and empirical data were analysed to track changes in the structure of medical services, investment volumes, and the formation of medical clusters.

Urban resilience theory underpins the evaluation of the role of medical tourism in strengthening cities' adaptive capacity during crises. The study draws on the foundational work of Holling [13], who introduced resilience as a system's capacity to absorb disturbances and reorganise while undergoing change, and on the conceptualisation by Meerow, Newell, and Stults [14], who define urban resilience through dimensions such as adaptability, robustness, and equity in urban systems. This framework informed the analysis of how medical tourism contributes to enhancing the resilience of urban environments – particularly in relation to infrastructure sustainability, social integration, and post-war recovery.

By combining these methodologies, the paper explores the interdependence between legal regulation, economic incentives, and urban resilience, aiming to propose integrative strategies for post-war medical tourism development in Ukraine.

# Results and Discussion.

# Global and Ukrainian Trends in Medical Tourism:

The development of medical tourism in the world, which began at the end of the XX century, outlined the main promising areas of medical services that are in greatest demand, and also identified countries that actively promoted the development of this industry by formulating national legislation favourable to both medical tourists and providers of such services. In the countries where medical tourism has been actively developing, government support mechanisms have been introduced to encourage its further growth.

In Ukraine, an example of positive dynamics in this area is the implementation of state support measures for medical tourism [15]. One of the most effective tools to stimulate the active development of medical tourism was the creation of special economic zones, including medical clusters. The main purpose of their creation was to accelerate the development of certain areas of medical tourism within specific regions. This helped to establish close cooperation between the authorities, business, and non-governmental organisations, as well as to develop professional ties with international partners. Clustering has helped to expand the range of medical and tourism services, create new jobs and increase local budget revenues.

# **Ukrainian Initiatives and Regional Clustering Experience:**

Although there are few examples of medical tourism clusters in Ukraine, the existing cases demonstrate the effectiveness and prospects of this approach, implemented on the basis of publicprivate partnerships. A good example is the Dnipro Medical Cluster, established in 2021 as a logistics centre for promoting the medical and tourism potential of the Dnipro region, as well as the development of regional, interregional and international medical and health tourism [16]. The impetus for the creation of the Dnipro Medical Cluster was the Decree of the President of Ukraine of 18.08.2020 No. 329, which provides for the creation of conditions to increase the tourist attractiveness of cultural heritage sites and the development of creative industries [17]. In this context, the cluster model was seen as a tool for synergising medical, tourism, educational and cultural initiatives. The cluster's activities are focused on implementing joint projects, supporting the initiatives of its members, developing related industries, and increasing the investment attractiveness of the region as a whole [18].

The Dnipro Medical Cluster was established as a substructural element of the Ukrainian Medical Tourism Association with the support of the Dnipro Regional State Administration under the Memorandum of Cooperation signed between the parties on 28 April 2021. The agreement envisaged the implementation of joint projects to develop medical and health tourism, create a favourable business climate in the region, and attract investors, patrons, foundations and research organisations. This format of interaction is an example of effective collaboration aimed at strengthening the region's competitiveness in the field of medical tourism.

However, the descriptive overview of the Dnipro Medical Cluster should be complemented by relevant quantitative indicators that reflect its actual impact and scale of activity.

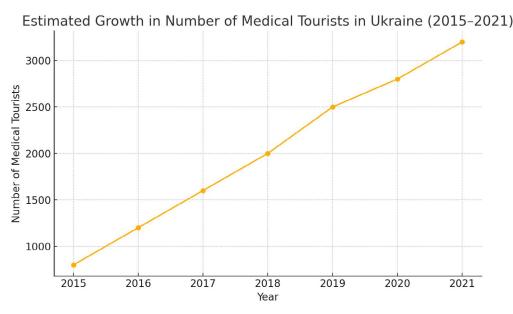


Figure 1. Estimated growth in the number of medical tourists in Ukraine between 2015 and 2021. Data are based on sectoral expert assessments and regional sources [16,18].

According to open data provided by the Dnipropetrovsk Regional State Administration and sectoral estimates by the Ukrainian Medical Tourism Association [16,18], in 2021 the Dnipro Medical Cluster served approximately 3,200 patients annually, of whom about 22% were foreign nationals. Investment in infrastructure development within the cluster exceeded UAH 35 million, and over 100 new jobs were created in the fields of diagnostics, rehabilitation, administrative services, and patient logistics. These figures demonstrate the cluster's real contribution to regional socio-economic development and validate its importance as a national model of medical tourism implementation. In addition to comparative benchmarking, the estimated dynamic growth of Ukraine's medical tourism sector in the pre-war period is illustrated in Figure 1.

Unfortunately, since the outbreak of the full-scale war in February 2022, no updated or comprehensive statistical data on the activities of the Dnipro Medical Cluster or the broader medical tourism sector in Ukraine have been officially published, which significantly limits empirical assessment of the current situation

Leading medical institutions and facilities in the region have become members of the Dnipro Medical Cluster, including: Dnipro Regional Children's Clinical Hospital, Dnipro Regional Perinatal Centre with Inpatient Department, Dnipro Regional Clinical Ophthalmological Hospital 'DOKOL', Dnipro Sensory World Centre for Medical and Social and Pedagogical Rehabilitation, Neo Dental Clinic, IVF Genesis Dnepr Reproductive Medicine Clinic, Family Diagnostic and Treatment Centre, Adassa Medical Clinic Plastic Surgery Clinic, Garvis Surgical Clinic [18].

The main goal of the Dnipro Medical Cluster was to promote the development of medical and health tourism by attracting domestic and foreign citizens to organised mass tourism, as well as to popularise the key areas of activity of the Cluster members (the so-called 'medical and tourist magnets') both in Ukraine and internationally. The most popular areas include: reproductive medicine, dentistry, plastic surgery, rehabilitation, cardiac surgery, ophthalmology, reconstructive paediatric surgery, neurosurgery, neonatology, laboratory and instrumental diagnostics, DETOX programmes for health improvement and rejuvenation, anti-aging therapy, cochlear implantation, comprehensive support for patients with orphan diseases, and inclusive tourism.

To achieve this goal, the Cluster members worked on:

- Increasing brand awareness of all Cluster members.
- Promoting the medical and tourism services provided by the Cluster members to the domestic and international markets.
- Participation in regional, national and international events such as workshops, B2B business programmes, seminars and trainings.
- Organising and conducting joint online webinars on topical issues of treatment, development of the medical industry and implementation of joint medical tourism projects.
- Organising information tours both in Ukraine and abroad.

Thus, such coordinated activities are aimed at developing medical tourism, expanding opportunities for patients, improving the quality of medical services, and promoting the region's medical potential internationally.

# Strategic Development Plans and Inclusive Projects:

In addition, the Dnipro region has developed a Strategy for the Development of Medical and Health Tourism, which provides for the implementation of a number of initiatives and measures aimed at improving the region's medical and tourism potential. The main areas of activity identified in the Strategy are:

- 1. Promoting digitalisation and attracting investors:
- encouraging investors, philanthropic organisations and foundations to invest in the development of medical tourism.
- identifying digital medicine as a priority area in the healthcare sector.
- creating and launching the medical tourism platform Dnipro Medical Cluster, an online resource that allows patients to create

their own tourist routes, integrating treatment, diagnosis and rehabilitation with active recreation and exploring the cultural heritage of the region.

- 2. Development of inclusive tourism:
- introduction of recreational tourism destinations for people with special educational needs and physical disabilities.
- ensuring a barrier-free environment, accessible transport links, high-quality services and a multidisciplinary approach to service delivery.
- identifying inclusive tourism as one of the priority areas of activity of Dnipro Medical Cluster.
  - 3. Formation of medical and tourist routes:
- development of comprehensive programmes that combine medical services with tourist attractions of the region and elements of creative industries.
- in July 2021, routes focused on dental, neonatal, neurosurgical, children's plastic and other types of medical services were published on the official website of the Dnipro Regional State Administration [19].
- 4. Presentation of the Strategy presentation of the Strategy for the development of medical and health tourism at the International Exhibition and Forum 'DniproExpo-2021'.
- 5. Participation in international forums presentation of the tourism and medical potential of the Dnipro region at the 5th Global Healthcare Travel Forum.
- 6. Organisation of the first international exhibition and conference holding in August 2021 the First International Exhibition and Conference of Medical Tourism 'Dnipro Medical Travel-2021', which aims to promote the region's opportunities, stimulate the growth of tourist flows and strengthen cooperation between the medical, tourism, insurance and related industries.
- 7. Representation at the international level participation of the Dnipro Medical Cluster delegation as part of the Ukrainian Medical Tourism Association in the Hestourex International Summit on Health, Sports and Alternative Tourism (Turkey, Antalya, 7-9 October 2021).
- 8. Joint implementation of the strategy the participation of Dnipro Medical Cluster members in the improvement and practical implementation of the Strategy for the development of medical and health tourism in the region.

These initiatives were aimed not only at promoting medical tourism in the Dnipro region, but also at developing the industry as a whole, attracting investors and increasing the economic potential of the region.

# Cluster-Based Medical Programmes for Targeted Patient Groups:

The Dnipro Medical Cluster's development strategy for 2021 envisaged the implementation of a number of projects and programmes aimed at developing medical tourism and providing quality medical care for different categories of patients. In particular, the following initiatives were planned:

1. The Sensory Aut Camp project is an inclusive correctional camp for children with autism spectrum disorders. The goal of the project is to create a high-quality sensory environment aimed at improving the health, rest and leisure of children with special educational needs. The camp introduces modern correctional techniques, including music therapy, play therapy, art therapy,

canister therapy, ergotherapy, 3C therapy, dance therapy, and fairy tale therapy.

- 2. The project 'Haemophilia. Dnipro' project was a programme of comprehensive medical support for children and adults with haemophilia, which included laboratory and instrumental diagnostics, treatment, medical and social rehabilitation, sanatorium treatment and recreation.
- 3. The programme 'Registration and medical support of children and adults with organ diseases in inpatient facilities' is an initiative aimed at providing comprehensive medical care to patients with severe chronic diseases.
- 4. Laboratory Diagnostics of Adult Patients with Coagulopathies is a project focused on conducting modern laboratory tests to establish an accurate diagnosis and determine further treatment tactics.
- 5. Emergency Care for Bleeding Disorders in Patients with Haemophilia is an initiative that provides a clear algorithm of actions for medical staff in case of critical conditions.
- 6. Medical and Social Rehabilitation for People with Haemophilia programme a programme that included measures to restore the functional state of patients, their social adaptation and improve their quality of life.
- 7. The programme 'Medical support and surgical care for adult patients with haemophilia in an inpatient facility' is an initiative aimed at performing complex surgical interventions, taking into account the specifics of the patients' clinical condition [20].

These projects demonstrate the cluster's focus on implementing innovative approaches to treatment, rehabilitation and comprehensive support for various categories of patients. They are an example of the practical implementation of the strategy for developing medical tourism and improving the quality of medical services in the Dnipro region.

The example of the creation and operation of the Dnipro Medical Cluster demonstrates the effectiveness and efficiency of the public-private partnership mechanism in the field of medical tourism. This form of cooperation provides medical institutions with more economic freedom and additional tools to improve the quality of services. In particular, it helps to improve the conditions of patients' stay in medical institutions, develop transport services, and upgrade the material and technical base, including the purchase of modern equipment.

Equality of rights between state-owned and privately owned institutions creates conditions for healthy competition between them and with foreign medical institutions. This not only stimulates the improvement of the quality of services, but also creates a competitive market for medical services in Ukraine.

The introduction of public-private partnerships also helps to reduce the gap between public and private healthcare facilities, providing foreign patients with access to high-quality services that meet their expectations. In turn, this generates additional revenues for the state and local budgets.

Thus, for several years prior to the full-scale invasion of Ukraine by the Russian Federation, the domestic medical tourism system was developing on the basis of systematic implementation of public-private partnership mechanisms, international certification of medical services, service improvement and gradual alignment of the quality of medical care with international standards [21].

# Legal and Economic Stimuli for Investment in Medical Tourism:

It should be emphasised that the development of medical tourism largely depends on an effective tax policy that provides an efficient mechanism for redistributing funds accumulated by the state from the economic sector to the social sphere - healthcare, education, social security, science and culture. In developed economies, public funding of the healthcare system plays an important role in ensuring access to quality healthcare services for all segments of the population.

Unfortunately, Ukraine currently lacks a balanced tax policy that would ensure the optimal redistribution of financial resources between profitable industries and socially important sectors. The healthcare sector remains underfunded, and market mechanisms are underdeveloped [22]. Therefore, one of the most promising areas for the development of medical tourism in the post-war period should be the formation of a favourable tax policy that can stimulate investment in the sector. Tax policy has a significant potential to attract foreign investment and socio-economic development, as the state can regulate investment processes through taxes, influencing the solution of specific investment tasks. At the same time, the tax policy tools should be not only fiscal, but also stimulating, i.e., having a positive impact on economic activity, development of social infrastructure and investment climate in the country [23].

In addition, state support for medical tourism can be implemented through encouraging national and international investment, creating favourable conditions for the development of the industry by simplifying and harmonising tax, currency, customs, border and other types of regulation [24]. It is important to introduce tax exemptions or preferences, preferential investment regime, development of resort infrastructure, and promotion of international cooperation in this area [25].

According to scientists, the effective functioning of medical tourism entities as a component of the tourism industry requires the creation of a number of key conditions. These include: a stable national monetary system; a clear and favourable taxation system that facilitates the rapid attraction of finance to the tourism business; an effective system of infrastructure support (hotels, transport companies, insurance institutions, sanatoriums and other healthcare facilities); guaranteeing the constitutional rights of citizens to life, healthcare and rehabilitation [26]. The introduction of such systemic measures will facilitate Ukraine's integration into the global medical tourism infrastructure, as well as increase its competitiveness and investment attractiveness at the international level.

Given the prospects for attracting national and foreign investment in the field of medical tourism, the provisions of the Law of Ukraine 'On State Support of Investment Projects with Significant Investments in Ukraine' [27] create a favourable basis for the development of this industry. An analysis of the provisions of Article 5 of this Law leads to the conclusion that an investment project with significant investments must meet the following requirements:

# 1. Scope of implementation.

The project must be implemented on the territory of Ukraine in certain areas of activity, in particular in the fields of healthcare, tourism and resort and recreation.

# 2. Construction and modernisation.

The project must provide for the creation, modernisation or technical and/or technological re-equipment of investment objects within the specified areas, including the purchase of equipment, components and construction of infrastructure facilities at the expense of the investor.

# 3. Job creation.

At least 80 new jobs must be created during the project implementation. The average salary of employees must exceed by 15% the average level of remuneration for the relevant type of activity in the region for the previous calendar year.

### 4. The amount of investment.

The amount of investment over the life of the project must exceed the equivalent of EUR 20 million, calculated at the official exchange rate of the National Bank of Ukraine on the first business day of the quarter of application and on the date of actual investment in accordance with the special investment agreement.

# 5. Implementation period.

An investment project with significant investments must be implemented within five years from the date of conclusion of the special investment agreement [28].

Compliance with these conditions is a prerequisite for the effective implementation of investment projects in the field of medical tourism, the creation of a favourable environment for investors, as well as improving the quality of medical services and overall economic growth.

State support for investment projects with significant investments may be provided to investors in the forms provided for in Article 3 of the Law of Ukraine 'On State Support for Investment Projects with Significant Investments in Ukraine'. In particular, these forms are:

- 1. Exemption from certain taxes and duties in accordance with the provisions of the Tax Code of Ukraine.
- 2. Exemption from import duties applies to new equipment (machinery) and its components, which are imported exclusively for the purpose of implementing an investment project with significant investments under a special investment agreement, in accordance with the Customs Code of Ukraine.
- 3. Granting a preemptive right to land use, including:
- transfer for use (lease) of a state or municipally owned land plot for the implementation of an investment project.
- establishing the investor's pre-emptive right to acquire such a land plot after the expiry of the special investment agreement (except in cases of its early termination), if provided for by the terms of the agreement.
- 4. Provision of construction of adjacent infrastructure facilities carried out at the expense of the state and local budgets, as well as other sources not prohibited by law. Such facilities include highways, communication lines, heat, gas, water and electricity supply facilities, engineering networks and other infrastructure elements necessary for the project implementation [28].

These forms of state support have the nature of temporary preferences and are aimed at intensifying investment activity, creating a favourable environment for attracting significant investments, as well as developing industries recognised as priorities for the national economy.

# **International Benchmarking of Medical Tourism Systems:**

In order to assess the prospects of Ukraine's medical tourism sector more objectively, it is important to compare its framework with leading global destinations. Countries such as Thailand, India, and Turkey have developed comprehensive national strategies for promoting medical tourism, supported by strong institutional coordination, active marketing campaigns, and investment-friendly policies.

Thailand attracts over 3 million medical tourists annually due to internationally accredited hospitals, competitive pricing, and government-backed promotional efforts [29]. India offers high-quality specialized services (e.g., cardiology, oncology, organ transplantation) at a cost up to 60–80% lower than in Western countries, benefiting from a large English-speaking medical workforce [30]. Turkey, in turn, combines modern infrastructure, EU-oriented quality standards, and geographic accessibility, drawing approximately 1 million medical tourists per year [31].

In contrast, Ukraine's medical tourism industry remains underdeveloped in terms of international branding, unified national coordination, and infrastructure investment, although it possesses significant potential due to its skilled medical personnel, affordable services, and natural therapeutic resources. Bridging this gap requires aligning regulatory and investment mechanisms with international best practices and intensifying institutional support.

# **Estimated Effects of Legal and Financial Incentives:**

Numerical estimations suggest that the full application of tax incentives defined in the Law of Ukraine "On State Support for Investment Projects with Significant Investments" could attract between EUR 50 to 100 million in targeted investment into health tourism infrastructure over a five-year period, assuming favourable macroeconomic and security conditions. This would correspond to the creation of approximately 2,000 to 3,500 jobs and a potential 10–15% annual increase in inbound medical tourism traffic, based on multiplier effects observed in Turkey and India [30,31].

Compared to existing research, such as OECD reports on India's incentive-driven expansion [30] and Turkey's state-supported cluster models [31], Ukraine's current policy lacks comprehensive implementation tools and centralized coordination. While the regulatory framework is generally favourable, the absence of dedicated national programmes, investment agencies for medical tourism, and internationally visible promotion campaigns significantly limits its effectiveness. Bridging this gap would require not only adopting legislative norms but ensuring their integration with economic instruments and cross-sectoral execution mechanisms.

# State Policy and Tax Incentives in Resort and Health Tourism:

Implementation of such investment projects can be carried out within the framework of the state policy of resort development, in accordance with the provisions of the Concept of Development of the Sanatorium and Resort Industry [32], as some of the objectives of this concept coincide with the objectives of medical tourism. In particular, organisational and production activities at resorts cover several key areas, due to

the complex nature of the health resort service (product). These areas include: medical care, accommodation, treatment, dietary nutrition, organised leisure, household services, etc.

An analysis of the provisions of the Tax Code of Ukraine [33] allows us to identify a number of tax preferences that may be granted to investors with significant investments who implement investment projects within the framework of a special investment agreement. Such tax advantages include:

- 1. Special taxation of corporate profits: in accordance with paragraph 55 of subsection 4 of section XX of the Tax Code of Ukraine, profits received as a result of the execution of a special investment agreement are exempt from corporate income tax for five consecutive years. However, the period of such exemption may not exceed the term of the special investment agreement, and the exemption is valid until 1 January 2035.
- 2. Exemption from value added tax (VAT): in accordance with clause 76 sub-cl. 2 of Section XX of the Tax Code of Ukraine, operations on the importation into the customs territory of Ukraine of new equipment (machinery) and its components, as defined in sub-clause 15 of clause 4 of Section XXI of the Customs Code of Ukraine, are exempt from VAT. This applies to equipment imported by a taxpayer-investor with significant investments solely for the purpose of implementing an investment project under a special investment agreement.
- 3. Benefits for payment for land plots: in accordance with clause 11 sub-sec. 6 of Section XX of the Tax Code of Ukraine, by decision of a local government, the following may be introduced:
- reduced rates of land tax or rent for state or municipally owned land:
- exemption from land tax until 1 January 2035.

Thus, the key factors contributing to the development of medical and health tourism in Ukraine are the effective establishment of a public-private partnership mechanism, the introduction of insurance medicine, the development and implementation of investment programmes in the field of healthcare and sanatorium treatment, etc. Compliance with these conditions, taking into account Ukraine's significant potential in the form of natural medical and recreational resources and an extensive network of health resort facilities of various forms of ownership, creates prospects for Ukraine to become a leader in the provision of medical and health tourism services.

# Institutional, Digital, and Post-War Aspects of Sectoral Growth:

Information factors play an equally important role in the development of medical tourism. In particular, EU countries pay considerable attention to the introduction of electronic technologies in the healthcare sector [34,35]. EUR 23 million has been invested to enable the exchange of information about patients and the treatment they receive between EU Member States. This contributes to the creation of an integrated system of electronic data exchange, which increases the availability and quality of healthcare services. In this context, the implementation of similar processes in Ukraine is a prerequisite for the effective development of medical tourism and integration into the European medical space.

Information measures defined in the Strategy for the Development of Tourism and Resorts until 2026 are also

important for the development of medical tourism [36]. In particular, it is important to disseminate information about international forums and conferences. In this area, it is worth noting the activities of the Global Healthcare Travel Council, which brings together medical tourism associations from more than 40 countries. This organisation plays a leading role in addressing global health issues, shaping the medical research agenda, developing norms, standards and ethical principles, as well as providing technical support to countries, monitoring and evaluating health trends in the context of medical tourism [37].

In Ukraine, the Ukrainian Medical Tourism Association plays an important role in the development of medical tourism. Using a regional approach, this organisation actively promotes the development of medical and health tourism, particularly in small towns and resort regions. Its activities are aimed at attracting investment, building modern medical centres, creating new jobs, and retaining qualified medical professionals who might otherwise emigrate in search of work abroad [38]. Thus, in the process of post-war reconstruction of Ukraine, the activities of the Ukrainian Medical Tourism Association will play an important role in ensuring the sustainability, institutional support and promising development of medical tourism in the country.

An important step in the development of medical tourism is the creation and launch of the Dnipro Medical Cluster Medical Tourism Platform. This online resource is designed to provide patients with the opportunity to independently create tourist routes that combine treatment, diagnosis and rehabilitation with active recreation. This approach allows medical tourism to be more effectively integrated into the overall system of the tourism industry and helps to increase its accessibility to a wide range of consumers.

In the post-war period, the development of a small 'green' medical tourism business in Ukraine is also a promising area. However, the functioning of rural 'green' medical tourism entities faces a number of factors that impede their effective operation. According to research, these factors include: insufficient use of foreign experience; unfavourable legal and economic environment for the rural population; inconsistency of actions of central executive authorities in the field of tourism with the principles of agricultural policy; different approaches to defining the essence of rural green tourism; lack of attractive conditions for investment and interesting credit resources; poor advertising of rural tourism at both the state and local levels; imperfections in the provision of quality services and mechanisms for protecting the rights of the rural population [39].

Advertising the services of Ukrainian rural 'green' tourism entities requires special attention. Effective measures in this direction could include: allocation of public funds to promote little-known villages of Ukraine with a focus on their historical and architectural heritage, customs and traditions; creation of favourable conditions for registration of rural owners as business entities providing tourist services; investment in the development of rural crafts; allocation of budget funds for the development of rural infrastructure; organisation of free courses on the basics of tourism and foreign languages for rural owners; regulating rural green tourism at the legislative level, etc.

We believe that taking into account these factors and measures will contribute to the development of small 'green' medical tourism, which will be accessible to both foreign and domestic consumers. This approach will allow integrating this segment into the overall strategy of medical tourism development in Ukraine, increasing its competitiveness at the international level.

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We believe that taking into account these factors and measures will contribute to the development of small 'green' medical tourism, which will be accessible to both foreign and domestic consumers. This approach will allow integrating this segment into the overall strategy of medical tourism development in Ukraine, increasing its competitiveness at the international level.

An important step for the further development of medical tourism in Ukraine is the development and adoption of a special Law of Ukraine 'On Medical Tourism'. This legal act should include the following key provisions: This legal act should include the following key provisions: definition of 'medical tourism activity' and the main types (areas) of this activity; peculiarities of the legal status and powers of business entities in the field of medical tourism, as well as the procedure for providing services; specifics of organisational measures aimed at carrying out economic activities in the field of medical tourism; principles of state policy in this area, as well as guarantees of quality and safety of the relevant services; financial mechanisms for ensuring the organisation of medical and tourism services; conditions and procedure for providing medical care to foreign citizens in Ukraine; conditions and procedure for receiving medical care by Ukrainian citizens abroad; list of diseases for which Ukrainian citizens have the right to be treated abroad at the expense of the state budget; the rights and obligations of providers of medical and tourism services within the framework of medical tourism; the rights and obligations of consumers of such services.

In addition, an important task in the post-war period will be to develop and implement a five-year Plan for the development of medical tourism in Ukraine with clearly defined stages of implementation. Such a plan should include:

- identification of priority areas for medical tourism development.
- introduction of benefits and preferences for entities providing services in the field of medical tourism.
- implementation of complex measures, in particular: creation and functioning of medical clusters; formation of a

unified register of medical tourism service providers; creation of new jobs, expansion of employment opportunities and self-employment of the population; development of modern information infrastructure in the field of medical tourism; ensuring efficient allocation of financial resources (state and local budgets, investments, grants from international organisations, bank and non-bank loans, non-governmental trust funds, leasing, etc.

The introduction of a comprehensive approach to regulatory and legal regulation, together with strategic planning in this area, will help to increase Ukraine's competitiveness in the international medical services market.

# Forced Medical Tourism and the Needs of Vulnerable Populations during Wartime:

The wartime conditions caused by the Russian Federation's full-scale aggression against Ukraine have led to the emergence of new social demands within the tourism and healthcare sectors. In particular, the tourism industry has mobilised support for military personnel, internally displaced persons (IDPs), and other victims of the war by providing financial assistance, temporary accommodation, transportation, food, and access to basic medical services.

One of the most significant humanitarian consequences of the conflict has been the large-scale movement of populations both within Ukraine and abroad. This has given rise to a new form of tourism — so-called forced tourism, where individuals travel not for leisure or education, but to access essential services such as housing, physical safety, medical and psychological care, and social support.

Within this context, forced medical tourism has emerged as a specific phenomenon. It involves the relocation of individuals from conflict zones to safer areas of Ukraine or other countries where adequate legal, financial, and logistical conditions have been established to ensure access to healthcare, rehabilitation, and social services [41].

# Social Rehabilitation and Medical Tourism for War-Affected Populations:

Internally displaced persons have faced a number of specific challenges: physical danger, loss of housing, employment, social ties, and a sharp decline in their material well-being. These factors have increased their vulnerability and necessitated external support, including housing, food, access to medical services, medicines, psychosocial assistance and rehabilitation measures.

The problem of access to the healthcare system was particularly acute for IDPs. Many of them needed regular medical care, treatment of chronic diseases, medicines, and assistance with exacerbations caused by stress and difficult living conditions. Thus, forced medical tourism has become a new social reality that requires proper scientific understanding, public policy and regulatory framework.

Today, Ukraine is facing the challenge of rehabilitating a significant number of military personnel and civilians affected by Russian aggression. Medical tourism for such people cannot always be funded by the state. One possible way to solve this problem is to introduce an obligation for medical tourism entities that have obtained licences and use Ukraine's natural

resources to provide free and preferential places for treatment and rehabilitation of privileged categories of citizens in proportions determined by the state.

The best option would be to increase pension, recourse and insurance payments for these categories of citizens, which would allow them to pay for treatment, rehabilitation and rehabilitation on their own. However, this option can only be implemented if the economy is stable and the hostilities end. Given the current situation with the significant costs of war, this approach should be postponed until after the restoration of the country's territorial integrity and an increase in state budget revenues. Instead, implementation of the first option - involvement of medical tourism entities in supporting privileged categories of citizens - should begin today.

Wartime has brought new social demands to the state, including providing victims and internally displaced persons with everything they need, providing services for their psychological and physical recovery, maintaining their mental and physical health, and financial and social support. The state responded to these challenges by creating the necessary social, legal and healthcare conditions to ensure that citizens' living standards in the new environment were sufficient and met the standards guaranteed by law.

Thus, taking into account current trends in medical tourism will help to create a regulatory framework for its further development in Ukraine and ensure state support. All of these measures will significantly improve Ukraine's international ranking in the provision of medical and tourism services, help attract investment into the national economy, and ensure the implementation of the state policy of resort development. This, in turn, will help to increase the flow of foreign tourists for medical and recreational purposes, develop inbound medical tourism, and ensure the protection of the rights and freedoms of the industry. In addition, this will have a positive impact on the country's budget revenues, job creation, infrastructure development and the overall improvement of the socio-economic situation in Ukraine.

# Conclusion.

On the eve of a full-scale war, Ukraine demonstrated high potential in the field of medical tourism, based on a combination of high-quality medical infrastructure, professional human resources, competitive pricing, an extensive network of healthcare and sanatorium facilities, and the development of public-private partnerships, such as the Dnipro Medical Cluster. The dynamics of creating strategies, digitalisation initiatives, implementing inclusive programmes and participating in international events demonstrated Ukraine's readiness to become an active player in the global medical tourism market.

The war has significantly changed the focus of the industry. The issues of access to medical services for internally displaced persons, organisation of medical care for military and civilians affected by the war, and rethinking the function of medical tourism from an economic tool to a humanitarian resource have come to the fore. At the same time, these challenges have highlighted the need for systematic development of the industry as one of the priorities of Ukraine's post-war recovery.

Based on the findings of this study and international best practices, the strategic directions of state policy in medical tourism can be grouped into three priority levels with corresponding implementation steps:

- 1. Immediate Priorities (2025–2026):
- Legislative regulation: adopt a dedicated Law "On Medical Tourism" that defines legal status, quality standards, and mechanisms of state supervision.
- Planning and coordination: establish an inter-agency coordination body and develop the National Medical Tourism Development Strategy.
- 2. Medium-Term Priorities (2026–2028):
- Investment incentives: implement tax preferences for certified medical tourism providers; simplify administrative procedures for cluster-based infrastructure projects.
- -Digital innovation: launch national medical tourism platforms integrating telemedicine, clinic ratings, and travel services.
- 3. Long-Term Priorities (2028 and beyond):
- Regional development: support rural and resort-based small businesses in health tourism; promote inclusive and rehabilitation tourism models.
- Social responsibility: introduce quotas or obligations for private providers to offer discounted services to vulnerable populations.

Each of these steps should be accompanied by a monitoring mechanism with performance indicators (e.g., number of foreign patients, investment volume, number of certified providers), coordinated by the Ministry of Health and regional authorities, with active involvement from the private sector and civil society.

The development of medical tourism is an important factor in shaping the resilience of Ukrainian cities, as it not only ensures resilience to external challenges, but also helps to restore economic activity, attract investment, improve the quality of medical services and strengthen social integration in times of crisis. Thus, medical tourism in Ukraine has not only significant potential as an economic sector, but also a strategic role in shaping a new model for the country's recovery - socially oriented, open to innovation, attractive to investors and focused on international partnership.

## REFERENCES

- 1. Teremetskyi V, Duliba Ye, Didkivska G, et al. Responsibility for ensuring the world biosafety: rethinking in the context of the COVID-19 pandemic. J Leg Ethical Regul Issues. 2021;24:1-12.
- 2. Teremetskyi V, Duliba Ye, Drozdova O, et al. Access to justice and legal aid for vulnerable groups: new challenges caused by the COVID-19 pandemic. J Leg Ethical Regul Issues. 2021;24:1-11.
- 3. Teremetskyi VI, Avramova OYe, Rusnak LM, et al. Correlation between the right to health care and the right to housing within medical and law-enforcement practice in terms of the COVID-19 pandemic. Georgian Med News. 2023;7:198-204.
- 4. Teremetskyi VI, Myronova GA, Batryn OV, et al. Legal guaranteeing for providing socially significant medical services during martial law and post-war recovery of Ukraine. J Law Sustain Dev. 2023;11:e1231.

- 5. Teremetskyi VI, Chmelyuk VV, Matsiuk VYa, et al. Problem of ensuring the right to medical care of a detainee (detained in custody) within criminal proceedings: experience of Ukraine and foreign countries. Georgian Med News. 2019;11:154-159.
- 6. Batryn OV, Teremetskyi VI, Ivakhnenko OA. Legal guarantees of availability of medical and rehabilitation assistance during martial law. Irpin Legal Chron. 2024;2:46-58.
- 7. Teremetskyi VI, Frolova OH, Batryn OV, et al. Vectors of development of the unified medical information space. Georgian Med News. 2024;6:55-60.
- 8. Rusnak L, Teremetskyi V. The legal nature and peculiarities of the provision of medical services by medical workers: vector of the Ukrainian doctrine. Bull Luhansk Sci-Educ Inst E.O. Didorenko. 2024;1:241-253.
- 9. Teremetskyi VI, Myronova GA, Batryn OV, et al. Legal nature of medical services: specifics of Ukrainian doctrine. Georgian Med News. 2024;1:80-87.
- 10. Teremetskyi VI, Muzychuk OM, Salmanova EY, et al. Problems of medical protection of persons sentenced to imprisonment. Wiad Lek. 2018;71:1777-1780.
- 11. Onishchenko NM, Teremetskyi VI, Kolesnikov AP, et al. Protection of confidential medical information in Ukraine: problems of legal regulation. Georgian Med News. 2024;4:161-168.
- 12. Teremetskyi V, Dmytrenko E, Pletnov O, et al. Health care sectors financial, civil, criminal and administrative liability in EU member states and Ukraine: results of comparative research. Georgian Med News. 2020;5:160-167.
- 13. Holling CS. Resilience and stability of ecological systems. Annu Rev Ecol Syst. 1973;4:1-23.
- 14. Meerow S, Newell JP, Stults M. Defining urban resilience: A review. Landsc Urban Plan. 2016;147:38-49.
- 15. Podzirov AO. Organizational and legal support for the development of medical tourism in Ukraine: monograph. Teremetskyi VI, editor. Kyiv: Scientific Research Institute of Private Law and Entrepreneurship, National Academy of Legal Sciences of Ukraine. 2024:242.
- 16. Dnipro Medical Cluster. 2025. http://med.cluster.tilda.ws/
- 17. On measures to support culture, protection of cultural heritage, development of creative industries and tourism: Presidential Decree of Ukraine No. 329, dated August 18, 2020. https://zakon.rada.gov.ua/laws/show/329/2020#Text
- 18. Dnipro Medical Cluster. Dnipropetrovsk Regional State Administration. 2021. https://adm.dp.gov.ua/turistichnij-kraj/medichnij-turizm-dnipropetrovshchini/dniprovskij-medichnij-klaster
- 19. Medical tourism routes of Dnipropetrovsk region. Dnipropetrovsk Regional State Administration. 2021. https://adm.dp.gov.ua/turistichnij-kraj/medichnij-turizm-dnipropetrovshchini/medichno-turistichni-marshruti-dnipropetrovshchini
- 20. Inclusive tourism. Dnipropetrovsk Regional State Administration. 2021. https://adm.dp.gov.ua/turistichnij-kraj/medichnij-turizm-dnipropetrovshchini/inklyuzivnij-turizm
- 21. Sysoienko I. Medical tourism a driver of healthcare development and additional funds for Ukraine! LB.ua. 2016. https://lb.ua/blog/iryna\_sysoenko/330143\_medichniy\_turizm-stimul rozvitku.html

- 22. Martyniuk UA, Kushnir LP, Terletska OV, et al. Formation of sustainable development of medical tourism in Ukraine. Reg Econ. 2021;1:91-99.
- 23. Teremetskyi V, Valihura V, Slatvinska M, et al. Tax policy of Ukraine in terms of martial law. Policy Stud. 2024;45:293-309.
- 24. Teremetskyi VI, Knysh SV, Stratonov VM, et al. Organizational and legal determinants of implementing international experience in the health care sector of Ukraine. Wiad Lek. 2019;72:711-715.
- 25. Hnedyk YeS. Means of regulatory influence of the state in the field of medical tourism. Pidpryiemnytstvo Hospod Pravo. 2019;3:80-86.
- 26. Hnedyk YeS. Legal regulation of economic activity in the field of medical tourism: dissertation for the degree of Candidate of Legal Sciences (12.00.04). Vinnytsia: Vasyl Stus Donetsk National University. 2020:238.
- 27. On state support for investment projects with significant investments in Ukraine: Law of Ukraine No. 1116-IX, dated December 17, 2020. https://zakon.rada.gov.ua/laws/show/1116-20#Text
- 28. Investment projects with significant investments in Ukraine: tax preferences. Press Service of the State Tax Service of Ukraine. 2022. https://tax.gov.ua/nove-pro-podatki-novini-/638901.html
- 29. Connell J. Medical tourism: Concepts and practices. Tourism Manag. 2013;34:1-13.
- 30. Lunt N, Smith R, Exworthy M, et al. Medical tourism: Treatments, markets and health system implications. OECD; 2011. https://www.oecd.org/els/health-systems/48723982.pdf
- 31. Bookman MZ, Bookman KR. Medical tourism in developing countries. New York: Palgrave Macmillan. 2007:112-134.
- 32. On approval of the Concept for the development of the sanatorium and resort industry: Decree of the Cabinet of Ministers of Ukraine No. 231-p, dated April 23, 2003. https://zakon.rada.gov.ua/laws/show/231-2003-%D1%80

- 33. Tax Code of Ukraine: Law of Ukraine No. 2755-VI, dated December 2, 2010. https://zakon.rada.gov.ua/laws/show/2755-17#n8035
- 34. Mykhailychenko HI. Development of a tourism product in the field of health and medical tourism in Ukraine. Efektyvna Ekonomika. 2020;2:1-12.
- 35. Melnychenko SV, Mykhailichenko GI, Kravtsov SS. Innovative growth of integrated tourism companies. In: Zukovskis J, Shaposhnykov K, editors. Innovative development of the economy: global trends and national features. Lithuania: Baltija Publishing. 2018:709.
- 36. On the approval of the Tourism and Resorts Development Strategy for the period until 2026: Decree of the Cabinet of Ministers of Ukraine No. 168-p, dated March 16, 2017. https://zakon.rada.gov.ua/laws/show/168-2017-%D1%80#Text
- 37. Mykhailychenko HI. Development of a tourism product in the field of health and medical tourism in Ukraine. Efektyvna Ekonomika. 2020;2:1-12.
- 38. Sysoienko IV, Tsymbaliuk VI, Tozon M, et al. Medical tourism in Ukraine: problems and prospects. Health-ua.com. 2016. https://bit.ly/3sx8tx6
- 39. Boiko VO, Boiko LO. Rural green tourism as an effective tool for revitalizing rural areas in the post-war period. In: Shandova NV, editor. Conceptual approaches and mechanisms for stimulating the development of socio-economic systems and market actors: monograph. Kherson: Vyshymyryskyi Publishing. 2023:68-79.
- 40. Buii LM, Vlodarchyk TV. Rural green tourism: problems and prospects. In: Scientific achievements of youth in solving the problem of human nutrition in the 21st century: abstracts of the 80th International Scientific Conference of Young Scientists, Postgraduates and Students; 2014 Apr 10–11; Kyiv. Kyiv: NUFT. 2014;3:486-487.
- 41. Teremetskyi VI. Medical tourism as a factor of economic recovery and a component of urban resilience. Bull Penitentiary Assoc Ukr. 2025;1:108-125.