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INVESTMENT-ORIENTED INNOVATIONS IN MEDICAL INSURANCE: STRATEGIES FOR SUSTAINABLE HEALTHCARE FINANCING IN THE DIGITAL ERA

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ABSTRACT

This article analyzes the implementation of investment-oriented innovations in the field of medical insurance to establish an effective and sustainable healthcare financing model amidst digital economic transformation. The authors provide theoretical justification for the role of innovations and investments in the development of the medical insurance sector, along with a deep analysis of the current state of medical services and the main barriers hindering innovation in this area. Special attention is given to assessing the impact of digitalization on the accessibility and quality of medical services, as well as the potential of using advanced technologies such as telemedicine and online platforms for insurance companies. It is considered that digital technologies, including telemedicine and online services, have the potential to significantly improve access to medical services and reduce costs. However, the implementation of these innovations faces several challenges, including issues of internet access, the lack of proper legal frameworks for regulating digital technologies in medical insurance, and the need to enhance financial literacy among the population. The authors summarize and propose a list of barriers (technical, regulatory, financial, cultural, psychological barriers, barriers related to human resources, and competition-related barriers) in attracting investments to the sector. Practical recommendations are offered for stakeholders, including insurance companies, government bodies, and users of medical services, to facilitate more effective innovation implementation and ensure sustainable financing of medical services. The strategic approaches to sustainable healthcare financing proposed in the article aim to ensure equal access to medical services for all population segments, improve the quality of insurance services, and optimize costs through digital tools.

Keywords: investments, innovations, sustainable development, healthcare, insurance, medical insurance, human resources

JEL Classification: C22, G18, G28

INTRODUCTION

In the context of today's digital transformation of society, the issue of ensuring the effective functioning of healthcare systems is becoming increasingly relevant. The growing demand for high-quality medical services, demographic shifts, the emergence of new risks, and global challenges, such as pandemics and climate change, necessitate a rethinking of traditional approaches to healthcare financing. Medical insurance, as one of the key tools for ensuring access to medical services, requires innovative renewal based on investment attraction and the implementation of digital technologies. In this regard, investment-oriented innovations serve as a catalyst for developing a resilient medical insurance model capable of effectively responding to contemporary challenges.

Despite the presence of well-developed medical insurance mechanisms in several countries, healthcare systems in many states continue to face significant issues: a shortage of financial resources, insufficient population coverage with insurance services, low efficiency in the management of medical insurance funds, and limited digital integration

of operational processes. These problems are particularly acute in countries with transitional economies, where the implementation of sustainable healthcare financing models is critically important for achieving the Sustainable Development Goals.

Although the topic has attracted scientific and practical interest, existing research only partially addresses investment in medical insurance in the context of digital innovation. There is a lack of comprehensive analysis of strategies that integrate financial stability, technological advancement, and social inclusion in the healthcare sector. This underscores the need for an in-depth study of innovation- and investment-based approaches to the development of medical insurance as a key component of sustainable healthcare financing in the digital era.

LITERATURE REVIEW

A considerable number of prominent scholars, both Ukrainian and international, have made a significant contribution to the study of the development of medical insurance, particularly in the context of its adaptation to the challenges of digital transformation and socio-economic upheavals. Among their contributions, notable are those scientific approaches that examine strategic management and state regulation of the insurance market, which directly influence the formation of sustainable healthcare financing mechanisms.

For instance, the article by Baranov, A. et al. (Baranov, 2022) highlights the specificities of state regulation of Ukraine's insurance market under martial law conditions. The authors emphasize that exceptional circumstances require flexible and adaptive approaches to regulatory policy, particularly in the field of medical insurance. They underline the need to strengthen government oversight of the fulfillment of insurance obligations, as well as the development of electronic customer service mechanisms, which lay the groundwork for the digitalization of healthcare services.

Researchers Born, P. et al. (Born, 2022) focus in their study on the relationship between economic transition and the development of insurance markets in post-communist European countries. In the context of medical insurance, they argue that institutional instability and a lack of trust in financial institutions hinder the integration of innovative solutions. Nonetheless, the authors stress that innovations and investments in digital tools (including telemedicine, online services, and electronic insurance policies) may become the driving force behind the sector's effective development.

Cherniakhovskyi, V. (Cherniakhovskyi, 2023), in a publication on the portal delo.ua, draws attention to the need to reform the regulatory policies of the National Bank of Ukraine concerning the insurance market in wartime conditions. The author emphasizes that the current system of insurance supervision must be transformed to reflect the realities of wartime and post-war periods, including the promotion of voluntary medical insurance through investment-oriented innovations and the creation of more transparent conditions for cooperation among the state, insurance companies, and healthcare institutions.

The development challenges of medical insurance and the broader insurance market amid the digital transformation of the economy remain the subject of active academic discussion among both Ukrainian and foreign scholars. A significant conceptual contribution has been made by Chvertko et al. (Chvertko, 2022), who emphasize the inclusive orientation of Ukraine's insurance market in the context of digitalization. The authors argue that the formation of a fair and accessible insurance model must be grounded in innovations and adaptation to the digital environment, which in turn creates conditions for expanding access to medical services for a wide range of the population.

The white paper *"Future Regulation of the Insurance Market in Ukraine"*, prepared by the National Bank of Ukraine, underscores the need to establish a new model of regulatory system that meets the challenges of the digital era. It emphasizes the importance of transitioning to risk-based supervision, the digital transformation of insurance companies' business processes, and the development of transparency and customer-centricity tools—critical aspects for the effective implementation of medical insurance.

Nechiporenko, A. (Nechiporenko, 2021) explores theoretical aspects of state regulation of insurance activities, highlighting the need for systemic modernization of market oversight approaches and the stimulation of investment in the insurance sector, particularly in medical services. This is especially relevant in the digital era, which calls for flexible management mechanisms focused on long-term development and efficiency.

Romashko, O. et al. (Romashko, 2020) also devote significant attention to rethinking the concept of the insurance market, proposing new approaches to interpreting its nature in light of global economic challenges. Their findings emphasize that digital transformation must be accompanied by the development of human capital, improvements in legislation, and the growing role of innovation in insurance products.

Shirinian, L. et al. (Shirinian, 2020) analyze the competitiveness of Ukraine's insurance market under globalization, highlighting the need for investment in digital infrastructure and the development of new services, including medical insurance. The authors note that innovations and the integration of digital technologies are key to ensuring the long-term sustainability of the market and increasing consumer trust.

Thus, the analyzed academic approaches demonstrate that the effective combination of innovative technologies, strategic management, and digital tools in the field of medical insurance is a crucial factor in building a sustainable and competitive model for healthcare financing. The research findings of Ukrainian and international scholars such as Baranov, Born, Chvertko, Nechiporenko, Romashko, and others confirm the necessity of a systemic modernization of the regulatory environment, institutional support for digitalization, and active investment in the development of innovative insurance products, particularly in the healthcare sector.

At the heart of this discussion lies the need to improve state policy in the insurance domain, develop technological infrastructure, ensure transparency, and enhance consumer trust. It is emphasized that digital transformation and innovation-oriented approaches are decisive for improving the accessibility and quality of medical services, especially under martial law and conditions of economic instability.

The need to study the investment- and innovation-driven development of medical insurance is driven by several key factors that hold strategic importance for Ukraine's socio-economic context: the growing demand for accessible and quality healthcare, the necessity to adapt insurance services to new digital realities, the need to strengthen the resilience of the financial system in times of crisis, and the creation of prerequisites for integrating Ukraine's insurance market into the European space. In this context, further in-depth scientific research and the implementation of comprehensive strategies focused on the sustainable development of the healthcare sector through innovative medical insurance mechanisms are essential.

AIMS AND OBJECTIVES

The purpose of the study is to provide a theoretical justification and develop practical recommendations for the implementation of investment-oriented innovations in the field of health insurance, aimed at creating an effective and sustainable model of healthcare financing in the context of the digital transformation of the economy.

The objectives of the study are as follows: to analyze the current state of health insurance under conditions of digitalization; to determine the role of innovations and investments in the development of the sector; to assess the barriers to the implementation of innovative solutions; to formulate strategic approaches to sustainable financing of healthcare services; and to develop practical recommendations for key stakeholders.

METHODS

A combination of general scientific and specialized methods was used in the research, including: methods of analysis and synthesis to provide a theoretical understanding of the nature of investment and innovation processes in the field of health insurance; a systems approach to identify interrelations between financing, innovation, and digitalization in healthcare; economic and statistical methods for processing and interpreting data; and graphical methods — for visualizing the research results.

RESULTS

Investment-oriented innovations in the field of health insurance are a key instrument for modernizing the financial architecture of healthcare systems, ensuring their sustainability, accessibility, and efficiency in the long term. In the context of digital transformation and rising healthcare costs, there is an increasing need to develop innovative insurance models capable of maintaining a balance between the social protection of the population and the economic efficiency of insurance mechanisms.

The theoretical foundation of this approach lies in the synthesis of concepts from innovation-driven development, institutional economics, digital economy, and inclusive finance. In particular, the investment-innovation approach views health insurance not only as a means of covering medical expenses but also as an active financial tool that channels capital into the healthcare sector through digital technologies, new business models, and public-private partnerships.

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Such innovations include: digital insurance platforms (InsurTech), the use of big data for risk assessment and personalized insurance products, smart contracts based on blockchain technologies, telemedicine as part of insurance coverage, and integration with electronic health systems. Thus, the implementation of investment-oriented innovations in health insurance not only optimizes financial flows within the healthcare system but also enhances its accessibility, transparency, and client-centricity.

In light of global digitalization trends, health insurance is undergoing a profound transformation driven by the development of cutting-edge technologies such as artificial intelligence, big data, blockchain, telemedicine, and other innovative solutions. Digitalization significantly improves the efficiency of health insurance services by expanding access, reducing administrative costs, and increasing the level of product personalization.

An analysis of the current state of health insurance in Ukraine during 2021–2024 from the perspective of the implementation of digital technologies by insurance companies is presented in Table 1.

Table 1. Analysis of digital technology implementation by insurance companies during 2021–2024. *(Source: Global Insurance Market Trends (2021–2022))*

Year	Implementation of Digital Technologies
2021	Introduction of online services for interaction between doctors, patients, and pharmacies; use of telemedicine
2022	Expansion of mobile application functionality by insurance companies; integration with platforms for medicine search and ordering
2023	Further implementation of digital solutions, including mobile applications and online services
2024	Active use of mobile apps for customer service; integration with government digital services such as "Diia"

Innovations and investments play a central role in the development of the health insurance sector, as they not only enhance the quality of medical service delivery but also ensure the sustainable growth of the insurance market itself. Ongoing technological advancements and substantial investment inflows enable insurers to optimize their operations, reduce costs, and create new opportunities for more efficient customer service. A deeper understanding of the role of innovation and investment in this field is crucial for the continued advancement of health insurance in the context of digital transformation.

Based on the analysis of digital technology implementation by insurance companies during the period 2021–2024, an assessment of the dynamics and structure of their expenditures on digital transformation was conducted (Table 2).

Table 2. Analysis of insurance companies' expenditures on digital technology implementation (2021–2024). *(Source: Digitization: benefits and ways to overcome challenges)*

Year	Key Digital Initiatives	Main Expenses	Estimated Expenditure Level (approx.), UAH million	Comments on Expense Structure
2021	Implementation of online services for interaction between doctors, patients, and pharmacies; telemedicine	▪ IT infrastructure development ▪ Server capacity ▪ Data security ▪ Staff training	≈ 280–350	Initial investments in innovation within the medical insurance sector. The largest costs relate to system integration and security.
2022	Expansion of mobile app functionality; integration with platforms for medicine delivery and search	▪ UX/UI design ▪ Mobile app technical upgrades ▪ API integrations ▪ Testing	≈ 400–500	The primary cost item is software development and API creation for external services.
2023	Widespread implementation of mobile services and personalized digital products	▪ CRM system development ▪ Data analytics ▪ Digital service marketing ▪ Cloud infrastructure	≈ 550–700	Companies focus on deepening digital customer service and Big Data for risk forecasting.
2024	Integration with the "Diia" state platform, online payments, and use of mobile applications across all insurance types	▪ Integration with government services ▪ Cybersecurity ▪ Mobile platform support ▪ Expansion of automation	≈ 750–950	The largest expenditures of the period relate to deep integration with e-Government platforms and comprehensive digital business transformation.

During the period from 2021 to 2024, insurance companies in Ukraine gradually increased their investments in digital technologies, transforming online services from an auxiliary channel into a primary one. The most significant growth in expenditures was observed in 2023 and 2024, indicating a transition to a mature phase of digital transformation within the insurance market.

By examining the stages and structural characteristics of insurance companies' expenditures on digital technology implementation over 2021–2024 (Table 2), it can be concluded that these investments have evolved beyond merely supporting internal modernization to become a powerful catalyst for the digital transformation of the entire insurance industry. In particular, they have contributed to a substantial renewal of client communication channels, automation of services, as well as increased data processing speed and quality of insurance offerings.

Therefore, it is appropriate to further analyze the actual outcomes of digitalization, reflected in both quantitative and qualitative changes in the functioning of the insurance market. In light of this, we propose to examine the dynamics of key online insurance indicators in Ukraine for the years 2021–2024, which will allow for correlating the volume of digital investments with tangible transformational shifts in the sector (Table 3).

Table 3. Dynamics of Online Insurance Indicators in Ukraine for 2021–2024. (*Source: Digitization: benefits and ways to overcome challenges*)

Indicators	2021	2022	2023	2024
Insurance premiums under contracts concluded via the Internet, UAH million	67,840.4	72,021.5	141,224.3	261,630.0
– including premiums under MTPL contracts (Mandatory Third-Party Liability Insurance for vehicle owners), UAH million	58,976.0	60,930.3	31,890.0	119,310.1
Share of insurance premiums concluded via the Internet in the total volume of insurance premiums, %	4.6%	4.7%	7.8%	14.4%
Number of online insurance contracts concluded, thousand units	4,100	4,580	6,750	10,230
Average size of online insurance premium, UAH	16,541	15,724	20,925	25,577
Number of insurers offering online contract processing, units	32	38	42	47

The dynamics of online insurance indicators in Ukraine from 2021 to 2024 convincingly demonstrate profound structural shifts in insurance services driven by digital transformation. There has been a significant increase in the volume of insurance premiums concluded via the Internet, indicating the gradual formation of a fully-fledged digital segment within the insurance market. By 2024, this volume had more than quadrupled compared to 2021, reflecting the maturity of digital channels and strong consumer demand.

Simultaneously, there is a clear trend toward reducing the dominance of certain insurance products, particularly MTPL (Mandatory Third-Party Liability Insurance), within the overall structure of online insurance. This points to the gradual diversification of digital offerings and growing interest in other types of insurance, including medical, property, and travel insurance. Customers demonstrate readiness to purchase more complex insurance products through online services, which results from both improved digital platform functionality and an increasing level of digital literacy among the population.

The share of online insurance in the total volume of insurance premiums has been steadily increasing. In 2024, it reached 14.4%, compared to only 4.6% in 2021. This indicates a qualitative shift in consumer behavior and adaptation by insurance companies to new conditions where digital tools have become not an addition, but a necessity for effective market presence.

Particular attention should be paid to the growth in the number of companies actively using online channels. This signals the spread of digital transformation as an industry-wide trend, no longer exclusive to technologically advanced players but becoming an integral part of the competitive strategy for most market participants.

The development of online insurance in Ukraine has already moved beyond the experimental phase to widespread implementation. This process is transforming not only the interaction between insurers and consumers but is also gradually redefining the concept of an effective business model in the insurance sector in the digital era.

Given the positive trajectory of online insurance development in Ukraine and the increasingly active adoption of digital technologies by insurance companies, special attention should be given to one of the most dynamic and socially significant market segments — medical insurance. In this context, innovation and investment play a key role, determining not only the competitiveness of insurance products but also the industry's ability to meet current challenges, particularly in healthcare, digital transformation, and social resilience.

Therefore, it is appropriate to place further emphasis on revealing the role of innovation and investment as fundamental drivers of medical insurance development in the new economic and technological reality.

Table 4 presents the key innovations and investments made in the health insurance sector, particularly in the context of digitalization and the adoption of new technologies. These innovations and investments shape the direction of industry development, improve access to healthcare services, and create new opportunities for insurance companies and their clients.

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Table 4. The Role of Innovation and Investment in the Development of the Health Insurance Sector. *(Source: Global Insurance Market Trends (2021–2022))*

Category	Innovations	Investments
Digital platforms and mobile apps	Implementation of platforms for policy signing, claim submission, and online medical consultations	Investments in the development and improvement of mobile apps and online platforms to provide easier access to healthcare services
Telemedicine	Development of video consultations and remote medical services	Investments in telemedicine technologies and infrastructure to enable remote service delivery
Big Data analytics	Implementation of systems for analyzing patient data, forecasting medical costs, and developing personalized insurance plans	Investments in Big Data analytics technologies to improve the efficiency of insurance products
Integration with other digital services	Integration of health insurance with national healthcare systems and provision of fast access to medical services	Investments in integration technologies and partnerships with other digital platforms to facilitate access to medical data and services
Infrastructure investments	Deployment of new technologies for operational automation and risk management	Investments in digital infrastructure development to ensure the efficiency and stability of insurers' operations
Development of new insurance products	Creation of insurance products incorporating advanced technologies, particularly for users of telemedicine or those with chronic conditions	Investments in the development of innovative insurance products tailored to modern market needs and technological advancements
Human resource investments	Training employees in the use of advanced digital technologies and enhancing their qualifications	Investments in the professional development of personnel working with new digital services to ensure high-quality customer service
Attracting international investors	Implementation of innovative solutions based on global best practices in health insurance	Investments from international funds to expand access to advanced technologies and innovations, and to enter new markets

Thus, innovations enable insurers to improve processes and enhance service accessibility, while investments provide the financial foundation for the development and implementation of these innovations.

Below is an assessment of the barriers to the implementation of innovative solutions in health insurance, which constitutes an important component of the sector's development strategy, as it helps identify obstacles and develop effective measures to overcome these challenges (Table 5). During digitalization and the adoption of new technologies, various barriers may arise that affect the efficiency of innovations and their adaptation within the framework of health insurance.

Table 5. Barriers to the Implementation of Innovative Solutions in Health Insurance. *(Source: Insurance Business Association. (n.d.); authors' own research)*

Barrier	Description	Impact Assessment
Technical Barriers	Underdeveloped infrastructure for implementing digital solutions (e.g., limited internet access in remote areas, low network bandwidth). Lack of integration between different data systems and platforms	Can significantly slow down the integration process of digital solutions, limiting access to medical services and complicating their quality for clients in poorly covered regions
Regulatory Barriers	Uncertainty or instability of the legislative framework related to digital technologies and health insurance. Imperfect regulations regarding personal data protection and confidentiality	Creates legal difficulties for implementing new technologies, which may lead to legal risks and slow down innovation development
Financial Barriers	High costs of implementing innovative technologies, including purchasing equipment, software, as well as staff training and data security	May cause economic difficulties for small and medium-sized companies, hindering innovation development in the sector, and reducing market competition
Cultural Barriers	Consumer and insurance companies' skepticism toward new technologies. Distrust of digital solutions and telemedicine among some clients due to low financial literacy and technical awareness	May reduce the acceptance of new technologies among the population, limiting innovation potential and lowering their effectiveness in health insurance
Human Resource Barriers	Insufficient staff qualifications to work with new technologies and implement them in health insurance processes. Lack of specialists able to quickly adapt to new technologies	Causes delays in the transformation of health insurance, slowing down the implementation of new technologies and their adaptation to market needs
Psychological Barriers	Resistance to change among insurance company employees is due to their being accustomed to traditional working methods. Client fears that technologies may reduce service quality or increase fraud risk	Reduces innovation effectiveness as some employees and clients are not ready for change, complicating the integration of new technologies.
Competition-Related Barriers	Insufficient readiness of major market players to implement new technologies due to fear of losing competitive advantages. Lack of standards and common rules that could facilitate the development of the innovation market development	May limit the growth of the innovation market, as large companies may be reluctant to quickly adopt new technologies, reducing market competitiveness and investment attractiveness

The analysis of barriers encountered during the implementation of innovative solutions in health insurance reveals that the main challenges revolve around several factors: from technical and financial barriers to cultural and psychological issues. Each barrier has its own impact on the processes of digitalization and innovation development; however, their interaction creates a complex challenge for health insurance amid rapid technological changes and advancements.

During the assessment of barriers to implementing innovative solutions in health insurance, a number of significant issues were identified that substantially affect the efficiency and pace of digital transformation in the industry. Particular attention is drawn to technical, regulatory, financial, and cultural barriers. Technical obstacles, such as the lack of stable infrastructure and difficulties integrating new technologies with existing systems, considerably complicate the process of adopting digital solutions in health insurance. This necessitates substantial investments in the development of modern infrastructure that supports digital tools, especially for the provision of telemedicine services and online consultations. Additionally, the presence of clear regulatory frameworks is a crucial factor to ensure transaction security, personal data protection, and customer trust.

Financial barriers also represent a critical factor restraining innovative changes in health insurance. The high costs associated with implementing new technologies, particularly for small and medium-sized insurance companies, constitute a significant hurdle to development. In this context, the role of government financial support for such enterprises becomes key. Moreover, serious investments in human capital are required, focusing on training and retraining personnel to work with new technologies.

Cultural barriers are also prevalent, related to consumers' reluctance toward new technologies and concerns about the privacy of their data. Addressing this issue requires informing the public about the benefits and security of digital medical services. Establishing effective feedback mechanisms with users is equally important to foster trust in digital platforms.

To overcome these barriers and ensure the sustainable development of health insurance in the digital era, efforts must be directed towards several strategic priorities. First and foremost, investments in infrastructure should focus on modernizing technological platforms that enable the deployment of advanced medical services, including telemedicine. Government support for such initiatives should become a vital component of the industry's development strategy, encompassing tax incentives or subsidies for small and medium enterprises facing financial constraints. Furthermore, creating a clear legal framework to safeguard data security is essential for building trust in digital solutions.

Equally important is the development of human resources through education and professional retraining programs, enabling staff to adapt to new technologies and ensure effective client interactions. Insurance companies should actively invest in their workforce, as this forms the foundation for providing high-quality customer service in the digital age. Supporting competition in the healthcare services market through access to cutting-edge technologies will improve service quality and stimulate innovation in health insurance.

Overall, ensuring sustainable financing and development of health insurance in the context of digitalization requires a comprehensive approach that includes investments in infrastructure, legal framework development, financial accessibility support, and human capital development. Only through the integration of these elements can sustainable growth and effective functioning of healthcare services in the digital era be achieved.

Table 6 presents practical recommendations for implementing investment-oriented innovations in the health insurance sector aimed at creating an effective and sustainable healthcare financing model amid the digital transformation of the economy.

Table 6. Practical Recommendations for Implementing Investment-Oriented Innovations in Health Insurance.

№	Recommendations	Expected Outcomes
1	Invest in the development of digital platforms for online doctor appointments and telemedicine, which will reduce healthcare costs and provide convenience for patients	Increased accessibility of medical services for patients and reduced costs of traditional healthcare
2	Create ecosystems for integrating medical data, enabling insurers to quickly access clients' health information and make more effective decisions regarding claims	Improved efficiency in managing medical data, leading to lower administrative costs for healthcare services
3	Develop mobile applications for health monitoring that can be used as preventive tools to reduce treatment expenses	Enhanced public health through increased access to monitoring and preventive technologies
4	Promote the development of payment systems and the creation of mechanisms for contactless payments for medical services via digital platforms	Convenience in payment transactions and reduced transaction costs for patients
5	Ensure the use of blockchain technology for storing medical records to increase transparency and reduce administrative costs related to data management	Increased security and transparency of medical data, reducing the potential for fraud and errors in healthcare processes
6	Introduce financial incentives for insurance companies implementing innovative technologies through tax benefits or subsidies	Attraction of additional investments into innovative projects and increased competition in the health insurance market
7	Develop educational programs for the population about digital medical services to reduce implementation barriers and improve financial literacy	Reduced distrust in digital medical services and stimulation of their widespread adoption among the population

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DISCUSSION

The scholarly works of Singhal, N., Voitovych, L. M., and Zhelizniak, R. Y. highlight important aspects of the development of the insurance market amid digitalization, economic transformation, and regulatory changes. However, an analysis of their research reveals several contentious issues that leave room for further academic inquiry and debate.

Specifically, Singhal, N. et al. (Singhal, 2022) emphasize the relationship between the development of the insurance sector and economic growth in the Asian region. The authors argue that insurance contributes to macroeconomic stability and long-term economic growth. Nevertheless, questions remain regarding the reverse effect: does economic growth always stimulate the development of the insurance market, particularly under conditions of weak financial inclusion or high socio-economic inequality? The issue of standardized approaches to assessing insurance effectiveness across different Asian countries is also debatable, given their varying levels of digitalization and financial maturity.

Voitovych L. et al. (Voitovych, 2021), analyzing the European experience of state regulation of the insurance system, underscore the advisability of adapting this experience in Ukraine. However, their article overlooks several barriers that may complicate this process, including structural characteristics of the Ukrainian market, weak institutional capacity, low public trust in insurance companies, and the slow implementation of European standards into the legislative framework. Questions remain open regarding the pace and feasibility of implementing such a model in Ukraine's post-crisis economy.

Zhelizniak, R. et al. (Zhelizniak, 2019) focus on the digitalization of the global insurance market and its impact on market structure and dynamics. The authors highlight the positive effects of digital technologies, such as process automation, the development of online services, and telemedicine. However, the readiness of different countries for digital transition remains a contentious issue, as the authors give insufficient attention to potential risks such as the digital divide, cybersecurity threats, user distrust, and regulatory uncertainty. Additionally, the role of investment support for digital initiatives is only briefly mentioned and warrants further exploration.

Thus, despite the significant contribution of these studies to the scientific discourse on insurance in the context of digital transformation, critical discussions remain regarding regulatory policy effectiveness, the impact of digitalization on system resilience, and the relationship between insurance and economic development across different socio-economic contexts.

The contentious issues arising in the study of investment-oriented innovations in the field of medical insurance are crucial for the further development of the sector and pertain to various dimensions from digitalization and investment to the challenges accompanying these processes. Several key questions require deeper analysis.

First, it is essential to consider the accessibility of medical services in the context of digitalization. Digital innovations in medical insurance open new possibilities for service delivery via online platforms and telemedicine. However, a question arises as to whether these services will be accessible to all population groups, especially those with limited Internet access or low digital literacy. In some countries, particularly in rural areas or among socially vulnerable groups, integrating such technologies may pose challenges.

Second, investments in medical insurance are a critical aspect requiring careful consideration. While investments can reliably support innovations, questions remain about the balance between private and public funding. How can insurance companies, private investors, and the government interact within a unified system that guarantees medical service accessibility for all citizens? This issue remains unresolved and calls for new approaches to regulation and market interaction in healthcare services.

Third, a significant barrier to effective innovation implementation is the lack of a unified legal framework regulating digital technologies in medical insurance. Issues of medical data security, user privacy protection, and the establishment of standards for telemedicine are vital. Without proper legal regulation, there is a risk of legal conflicts and abuses.

Equally important is the analysis of the economic feasibility of innovation adoption in medical insurance. Although investments in digitalization may be substantial, they can provide long-term savings through process automation, reduction of operational costs, and improved service quality. However, the initial stages of technology adoption may involve high expenses, creating temporary financial difficulties for many insurance companies.

Another contentious issue is the universality of medical insurance models. Since medical insurance systems largely depend on the economic, social, and cultural conditions of a country, implementing innovative solutions must consider these specificities. International experience is important but not always directly transferable; therefore, each country must seek optimal paths for transforming its medical systems in the context of digital technologies.

Finally, the level of financial literacy among the population is a critical factor. The introduction of innovative digital platforms in medical insurance should be accompanied by active educational efforts aimed at improving financial literacy. People need to understand how to use new online tools to select insurance, access medical services, and manage their policies. Lack of adequate financial literacy may result in ineffective use of new technologies, reducing their potential to improve access to medical services.

In conclusion, the contentious issues in the study of investment-oriented innovations in medical insurance are multifaceted and require thorough analysis. Successful implementation of innovations in this sector demands a balanced approach that takes into account not only economic but also social and legal aspects, as well as the needs and expectations of different population groups.

CONCLUSIONS

The study conducted a comprehensive analysis of the current state of medical insurance in the context of digitalization, which allowed for the identification of key trends, opportunities, and challenges for the further development of this sector. Particular emphasis was placed on the impact of digital technologies on medical insurance, including the automation of processes, the implementation of online services to facilitate access to medical care, and the optimization of medical data management. The issues examined demonstrate that digitalization is not only a driver of development but also a crucial tool for ensuring accessibility and efficiency of medical services, as well as enhancing financial inclusion within the industry.

The analysis of insurance companies' expenditures on digital technology implementation during 2021–2024 revealed a gradual evolution from deploying basic online services to integrating with national platforms such as "Diia." This indicates a growing openness of the market to innovative solutions and the gradual formation of a digital medical insurance ecosystem.

The presented dynamics of online insurance indicators in Ukraine demonstrated a rapid increase in the share of online insurance within the total volume of insurance premiums, alongside a transformation in the structure of digital products. The decline in the share of MTPL (compulsory motor third-party liability insurance) among online products reflects rising demand for other, more complex services, including medical insurance. This trend confirms the effectiveness of investments in digital transformation and opens new opportunities for the further development of personalized digital insurance solutions.

One of the primary objectives was to determine the role of innovation and investment in the advancement of medical insurance. It was concluded that investments in digital infrastructure and new technologies must become a priority for insurance companies and governmental bodies alike. Such investments should contribute not only to expanding access to medical services but also to significantly improving the efficiency of healthcare delivery through the adoption of innovative solutions such as telemedicine, mobile health monitoring applications, and technologies for secure storage and processing of medical data (e.g., blockchain). These innovations have the potential to substantially reduce healthcare costs, improve service quality, and increase transparency within the medical insurance system.

The assessment of barriers to implementing innovative solutions revealed several obstacles, including an insufficient legal framework for regulating digital technologies in medical insurance, limited financial literacy among the population, and high initial costs for insurance companies investing in cutting-edge technologies. However, these barriers can be overcome through a comprehensive approach to legislative reform, enhanced government support, and the development of educational programs aimed at increasing public trust in digital medical services.

According to the study’s findings, an important aspect is the formation of strategic approaches to the sustainable financing of medical services. This requires creating mechanisms to attract private investment, government subsidies, and grants, as well as developing new financial instruments such as specialized investment funds dedicated to the advancement of digital technologies in medical insurance. The introduction of such instruments will not only improve access to medical services but also foster the development of a healthy and resilient financial ecosystem capable of adapting to rapid changes in the economic environment.

Practical recommendations have been developed targeting the key stakeholders involved in this process – government agencies, insurance companies, healthcare providers, and consumers. It is recommended to actively promote investment-oriented innovations within the medical insurance system, create favorable conditions for the development of digital infrastructure, expand access to medical services via mobile platforms and online services, and implement educational programs for the public, highlighting the benefits and possibilities of digital medical services. Additionally, incentives should be

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established for insurance companies to integrate advanced technologies, including government subsidies, tax benefits, and investment programs.

Thus, to establish an effective and sustainable model for financing medical services amid digital transformation, coordinated efforts are required from the state, business sector, and civil society. The application of investment-driven innovations will significantly enhance the quality of medical services, reduce the financial burden on patients, and ensure the sustainable development of the medical insurance system in the future.

In the context of further research, it is advisable to broaden the analytical focus toward quantitatively measuring the effectiveness of digital investments in medical insurance. In particular, modeling the impact of digital innovations on key indicators such as companies' financial stability, accessibility of medical services, customer satisfaction levels, and coverage of uninsured population groups holds significant promise. Such studies will provide an evidence-based foundation for informed decision-making both at the level of public policy and within the strategic frameworks of individual insurance companies.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

All authors have contributed equally.

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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

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ІНВЕСТИЦІЙНО ОРІЄНТОВАНІ ІННОВАЦІЇ В МЕДИЧНОМУ СТРАХУВАННІ: СТРАТЕГІЇ СТАЛОГО ФІНАНСУВАННЯ ОХОРОНИ ЗДОРОВ'Я В ЦИФРОВУ ЕПОХУ

Стаття присвячена аналізові впровадження інвестиційно орієнтованих інновацій у галузь медичного страхування з метою формування ефективної та сталої моделі фінансування охорони здоров'я в умовах цифрової трансформації економіки. Автори здійснили теоретичне обґрунтування ролі інновацій та інвестицій у розвитку галузі медичного страхування, а також провели глибокий аналіз сучасного стану медичних послуг та основних бар'єрів, які гальмують упровадження інновацій у цій галузі. Окрема увага приділена оцінці впливу цифровізації на доступність і якість медичних послуг, а також можливостям використання новітніх технологій, таких як телемедицина та онлайн-платформи для страхових компаній. Визначено, що цифрові технології, зокрема телемедицина та онлайн-сервіси, здатні значно поліпшити доступ до медичних послуг і зменшити витрати на їх надання. Проте впровадження цих інновацій стикається з низкою викликів, серед яких проблеми доступу до інтернету, відсутність належної правової бази для регулювання цифрових технологій у медичному страхуванні, а також необхідність підвищення рівня фінансової грамотності населення. Автори узагальнили та запропонували перелік бар'єрів (технічні, регуляторні, фінансові, культурні, психологічні бар'єри; бар'єри, пов'язані з людськими ресурсами та пов'язані з конкуренцією) у залученні інвестицій до галузі. Автори запропонували низку практичних рекомендацій для зацікавлених сторін, зокрема для страхових компаній, державних органів і користувачів медичних послуг, що сприятимуть більш ефективному впровадженню інновацій і забезпеченню сталого фінансування медичних послуг. Стратегічні підходи до сталого фінансування охорони здоров'я, запропоновані в статті, спрямовані на забезпечення рівного доступу до медичних послуг для всіх верств населення, покращення якості страхових послуг та оптимізацію витрат через цифрові інструменти.

Ключові слова: інвестиції, інновації, сталий розвиток, охорона здоров'я, страхування, медичне страхування, людські ресурси

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