Journal of Social Sciences *Vol. VIII, no. 4 (2025), pp. 187 - 201*
Fascicle *Social Science* *ISSN 2587-3490*
Topic *Sociology* *eISSN 2587-3504*

https://doi.org/10.52326/jss.utm.2025.8(4).12
CZU 614.2:004.9:338.46(478)

DIGITALISATION OF THE TRANSNISTRIAN REGION HEALTH SYSTEM AS A REGIONAL COMPONENT IN THE DNIESTER RIVER ECOSYSTEM

Corina Kaushan[2*], ORCID: 0000-0001-5021-6473,
Svetlana Gorobievschi[1], ORCID: 0000-0003-4600-881X,
Ghenadie Radu[1], ORCID: 0009-0004-4593-6280,
Anatolie Babin[3], ORCID: 0000-0002-7253-0890

[1]*Technical University of Moldova, 168 Stefan cel Mare Blvd., Chisinau, Republic of Moldova,*
[2]*UEPES "Constantin Stere", 200 Stefan cel Mare Blvd., Chisinau, Republic of Moldova,*
[3]*Academy of Economic Studies of Moldova, 61 Strada Mitropolit Gavriil Bănulescu-Bodoni, Chisinau, Republic of Moldova*
*Corresponding author: Corina Kaushan, *kausankorina@gmail.com*

Received: 11. 17. 2025
Accepted: 12.18. 2025

Abstract: The European Union provides unprecedented support to developing regions and autonomous territorial communities in the Republic of Moldova through the "Economic Recovery Plan for Moldova," emphasizing the need to implement ambitious reforms for the benefit of citizens and to strengthen health systems in response to the COVID-19 pandemic. This study examined the current state of the healthcare system in the Transnistrian region and highlighted the urgent need to integrate it into the European digital ecosystem. The digital transformation of the economy and the healthcare sector in the Eastern Partnership (EaP) regions constitutes a strategic objective, with significant implications for interregional cooperation, the development of small and medium-sized enterprises, and community well-being. In this context, the implementation of the *Living Lab* concept was proposed through an innovative public–private partnership model aimed at modernizing "Family Medicine Centers" and facilitating electronic interactions of the G2C, G2B, and G2G types. Such an approach would enhance the interoperability of information systems and strengthen cooperation among universities, local administrations, businesses, and civil society. The study's conclusions underscore the considerable potential of digital transformation to improve healthcare service delivery and economic collaboration, highlighting its role in promoting sustainable development and improving the quality of life in the region.

Keywords: *digitalization, quality of life, development strategy, population welfare, health measures, medical services, quality of medical services, health economy.*

Rezumat: Uniunea Europeană oferă un sprijin fără precedent regiunilor în dezvoltare și comunităților teritoriale autonome din Republica Moldova prin „Planul de redresare economică a Moldovei", accentuând necesitatea implementării unor reforme ambițioase în beneficiul cetățenilor și consolidării sistemelor de sănătate în contextul pandemiei de COVID-19. Studiul de față a analizat starea actuală a sistemului de sănătate din regiunea Transnistria și a evidențiat necesitatea urgentă de integrare a acestuia în ecosistemul digital european. Transformarea digitală a economiei și a sectorului sănătății în regiunile Parteneriatului Estic

(EaP) reprezintă un obiectiv strategic, cu impact semnificativ asupra cooperării interregionale, dezvoltării întreprinderilor mici și mijlocii și creșterii bunăstării comunitare. În acest context, a fost propusă implementarea conceptului de *Living Lab* printr-un model inovator de parteneriat public–privat, orientat spre modernizarea „Centrelor de medicină de familie” și facilitarea interacțiunilor electronice de tip G2C, G2B și G2G. O astfel de abordare ar spori interoperabilitatea sistemelor informatice și ar consolida cooperarea dintre universități, administrațiile locale, mediul de afaceri și societatea civilă. Concluziile studiului evidențiază potențialul considerabil al transformării digitale de a îmbunătăți furnizarea serviciilor de sănătate și colaborarea economică, subliniind rolul acesteia în promovarea dezvoltării durabile și a creșterii calității vieții la nivel regional.

Cuvinte cheie: *digitalizare, calitatea vieții, strategie de dezvoltare, bunăstarea populației, măsuri în domeniul sănătății, servicii medicale, calitatea serviciilor medicale, economia sănătății.*

1. Introduction

Digital health is one of the priorities of the health system transformation process and brings great benefits to patients, health personnel and public authorities [1]. Digitalization of the health system will give citizens secure access to their personal health data and provide patients with digital tools to take care of their health, prevent diseases, and communicate and interact with health care providers. It is expected that the implementation of sustainable solutions in the field of digital health and health services, in the next phase of the Transnistrian reforms, including initiatives of settlements on both banks of the Dniester River valley [2], to establish a trans-river health platform under the EU-UNDP " Support to Confidence Building Measures Programmer (V)”[3] between the two banks of the Dniester , will improve the quality and accessibility of health services for local residents, contributing to the effectiveness of the economic integration of settlements and small towns into the "Single Digital Market"[4].

This patient-focused advancement is swiftly reshaping the industry's operations and the development and delivery of services, while rebuilding connections between essential stakeholders, including the research sector, patients, healthcare professionals, providers, and regulators. The stages of the digital model are proposed in correlation with the data throughout the life cycle of medicines for the individual (Figure 1).

The context of the COVID-19 pandemic perhaps more than other circumstances highlights the benefits of introducing eHealth tools into medical practice, both in the current crisis and in the future, through the promise it offers. Case studies of eHealth through the application of modern technology require a multidisciplinary approach [6] and adaptation of European best practice to the local context. The subject of this study is the Transnistrian region. One of the pressing issues in modern society is the fight against viruses, particularly COVID-19, which caused a global economic collapse but also created the conditions and opportunities for the growth of IT companies. "A study of the main trends in the development of digitalization of health at the global and local levels has shown that global technological progress provides medicine with various hardware and software tools that facilitate the work of specialists and reduce the costs of health care delivery" [7].

The population of Transnistria as of January 1, 2023 was 436.6 thousand people. Urban areas account for 71.1% of the population. The largest towns are Tiraspol (129.2 thousand people), Bender (73.2 thousand people) and Ribnitsa (41.8 thousand people). The population

density region Transnistrian is 118.1 people per sq. km. The ratio of men to women is 1,213 women per 1,000 men. The crude birth rate is 9.9 persons per 1000 population, and the crude death rate is 13.7 persons per 1000 population, which results in a negative population increase (attrition) of 4.3 persons per 1000 population.

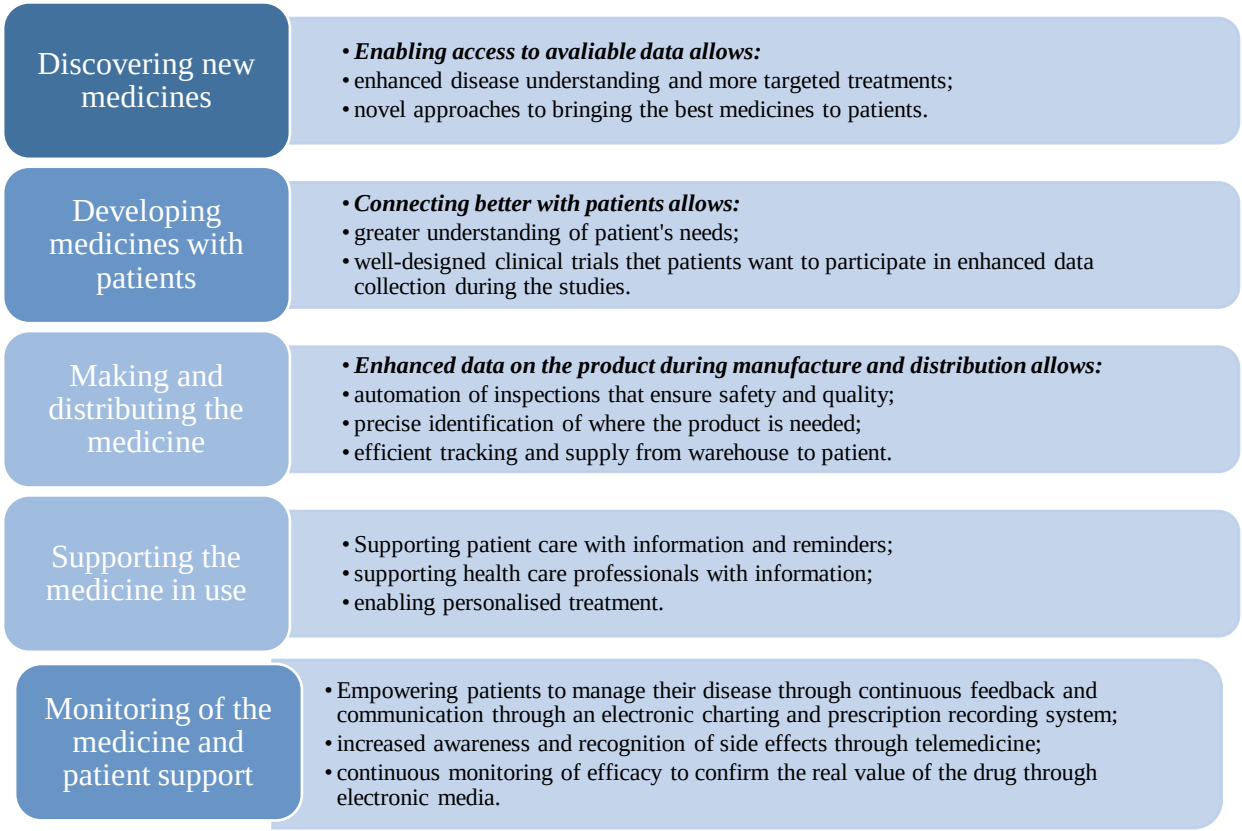

Figure 1. Use of digital technologies and data in the lifecycle of medicine [5].

Life expectancy at birth is 71.4 years. State expenditures for health care in 2022 amounted to 818.8 million Transnistrian rubles (2.3% of the total budget expenditures) or 1,122 rubles per capita. An improvement in the epidemiological situation regarding COVID-19 during the reporting period contributed to a reduction in the volume of medical-pharmaceutical products purchased. Despite this, funds were allocated for the healthcare system reserve in 2023, amounting to 110 million rubles. These funds were allocated to:

- supplementary payments to healthcare workers in contact with COVID-19 patients;
- repayment of accounts payable for the provision of nutrition services to patients and medical staff of level II infectious diseases hospitals;
- therapeutic feeding of in-patients and feeding of medical staff at specialized infectious disease level II hospitals for the treatment of COVID-19 patients;
- purchase of pandemic medical-pharmaceutical products;
- maintenance of ambulance services in hospitals and other areas.

The region Transnistrian health sector employs 11,400 people (11.5% of those employed in the economy) including 1,788 doctors and 4100 middle-level medical workers. The average monthly nominal wage of health workers in 2022 is 2778 Transnistrian rubles, i.e. 68% of the average wage of workers in the economy. In the figure 2, shows information on the distribution of current health expenditures region Transnistrian in 2022-2023. It should be noted that in 2023 the focus in the provision of preventive services in 2023 was

3.8% higher, the provision of medical care on an outpatient basis by 1.2%, while assistance in stationary conditions decreased by 3.5% compared to the previous year.

State expenditures for health care in 2022 amounted to 818.8 million Transnistrian rubles (2.3% of the total budget expenditures) or 1,122 rubles per capita. An improvement in the epidemiological situation regarding COVID-19 in the reporting period was the main factor contributing to a reduction in the volume of medical-pharmaceutical products purchased [8].

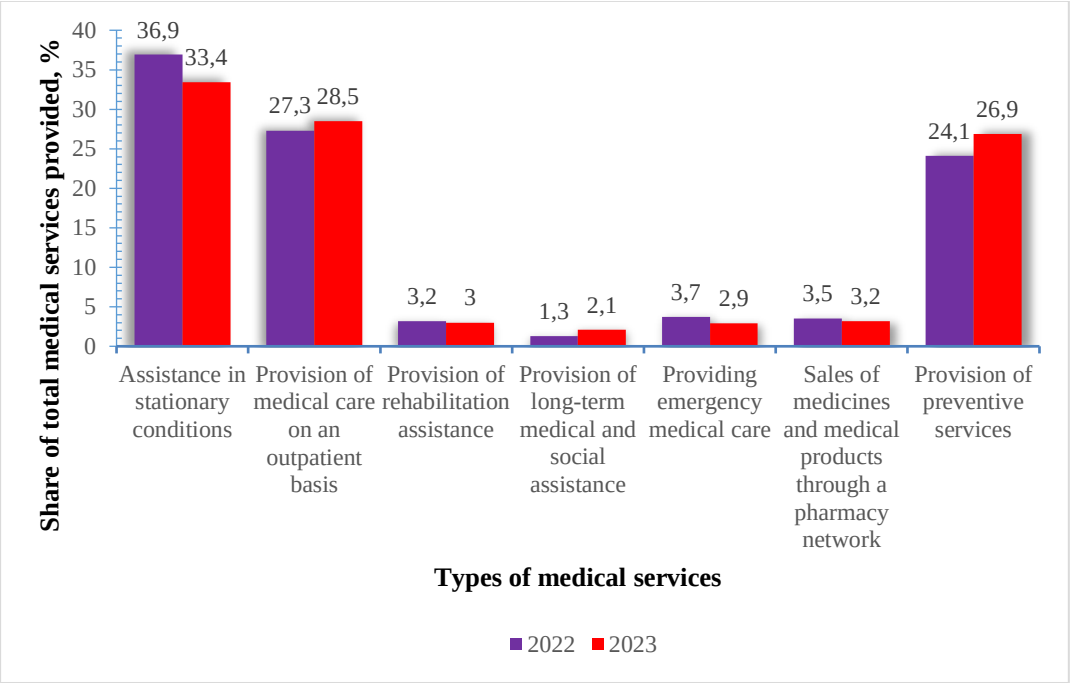

Figure 2. Information on the distribution of current health expenditures in Transnistria region in 2022.

All this requires a serious analysis of the reasons that have given rise to these trends, including the problems of the organization of health care, the solution of which would make it possible to improve the efficiency of the system of organization of medical care and change the unfavorable development of the medical and demographic situation observed in recent years. The introduction of compulsory health insurance provides a solution to many problems, including increased digitalization and the implementation of a roadmap.

Primary health care is provided to the population of Transnistria according to the territorial-participatory principle: each territory is divided into doctor's areas with a certain number of people assigned to them. Both medical and pre-hospital care are provided according to this principle. This creates the preconditions for the continuous monitoring of sick and healthy persons alike. The fact that the level of social benefits is low in relation to the actual situation of the people who receive help is reflected in the critical situation.

More than 40% of the income of socially vulnerable people depends on social payments, the gross wage replacement rate is around 29%, and with the average pension in the region, it is below the subsistence level. In the current conditions of demographic crisis, the state's priority is to save and improve all components of "health" and to increase the preventive orientation of the healthcare system.

The main problems of the healthcare system in the Transnistrian region include:

Prevalence of therapeutic activity over preventive measures: The focus is primarily on treating existing conditions rather than preventing them, which can lead to higher healthcare costs and poorer long-term health outcomes. The issues reflect some significant challenges

in healthcare systems that can hinder the delivery of quality care. Here's a breakdown of each point and potential solutions:

Table 1

Challenges and solutions of the health system on the left bank of the Dniester in the context of health care

Sector	Challenge	Potential Solutions
Low Structural Efficiency of the Current Model	Emphasizing inpatient care over community-based services leads to inefficiencies. Resources such as staff, equipment, and space may be underutilized in district settings, while inpatient facilities are overburdened.	- Shift to Preventative Care: Focus on preventive and outpatient care to reduce the need for inpatient services. - Community-Based Health Models: Implement models that integrate community health workers, mobile health services, and outpatient facilities to reduce the pressure on inpatient care. - Better Resource Allocation: Use data analytics to identify areas with resource underutilization and redistribute resources more efficiently.
Lack of Systematic Post-Graduate Training for Doctors	Without continuous education and professional development, healthcare providers may struggle to stay current with medical advancements and best practices, leading to suboptimal care.	- Structured Continuing Education Programs: Create mandatory post-graduate programs, workshops, and certifications to help doctors keep up with new techniques, technologies, and research. - Partnerships with Universities: Partner with medical schools and institutions to provide access to the latest educational content and research. Online Learning Platforms: Leverage digital platforms to offer ongoing education, making it more accessible and convenient for healthcare professionals.
Lack of Staff Motivation	Healthcare workers may lack the necessary incentives to improve skills, use resources efficiently, and provide high-quality care, which can lead to lower productivity and patient dissatisfaction.	- Incentive Programs: Develop recognition and reward systems for staff based on performance, such as offering bonuses, career advancement opportunities, or professional development funding. - Promote Work-Life Balance: Address issues like burnout and work-life imbalance by offering support programs and ensuring fair staffing levels. - Engagement and Leadership: Encourage a culture of leadership and engagement within teams. Empowering staff with more autonomy and involving them in decision-making can boost motivation.

Elements of digitization are necessary for a productive and viable health system. Gorobievschi et al. article [18], highlight the significant role of electronic patient registers in evaluating health status. These registers indirectly contribute to improving health through quick access to information, serving as a simple, cost-effective, and efficient tool for making medical decisions, identifying the form of the disease, and determining appropriate treatment, as outlined in the e-health strategy. Health monitoring tools enable the

assessment of the effectiveness and safety of treatments by continuously tracking their outcomes.

The authors point out that Big Data resources are becoming more and more available every day. "Public administration, industry, medicine, retail, social media, banks and the internet of things - there is a huge amount of information coming up every day in these and other areas. But conventional software is not capable of analyzing this volume of data. That is why machine learning is handling terabytes and zettabytes of information. The new ability to analyses such arrays is affecting many areas of life, including business, healthcare, communication and entertainment" [12].

In addition to the "development of e-learning and networking, the last two years have seen an acceleration in the adoption of innovative technologies and techniques. The use of telemedicine techniques for patient counseling, oncology consultation, and treatment planning has increased significantly, and cloud-based and remote systems now enable effective care while reducing the need for on-site staff and facilities" [13]. The authors agree with the assertion that "Health professionals will have accessible and structured patient information for the entire time of follow-up and treatment in all health care settings" [14]. The main thing to note is that the message of the law is not at all related to telemedicine technologies, but to electronic medical document flow. In region Transnistrian, has not yet developed a roadmap algorithm and an electronic patient card, nor has the document flow for the ethics committee been systematized. All, absolutely all documents related to a patient's health, including prescriptions for potent drugs from 2023-2025 [15] must be created, stored, transmitted and processed electronically and, as a burden, also protected against new types of threats.

It should also be noted that in the current context, with society facing a profound post-pandemic crisis, there is full awareness of the need for transparency and efficiency in health information flow, as existing information systems lack interoperability [16], capacity and infrastructure and this, in turn, leads to a number of shortcomings on the information flow and data access side. A streamlined health management system converts population health data into clinical and economic insights, including electronic patient registration, home health services, and remote monitoring. It focuses on prevention and promotes healthy lifestyles. Telemedicine allows patients to consult doctors online for advice and follow-up, especially for those who have already had in-person consultations [14].

This is very important for residents of big cities and megalopolises, who often do not have enough time to get to a doctor in time and also to stand in queues. Improvement of the mechanisms and tools for coordination and implementation of the national regional development policy is reflected in achieving the goal of introducing the electronic patient record, a prerequisite for ensuring effective and efficient implementation of the specific elements of the reform for 2025. "The main problem in the implementation of regional development policy has so far been the failure to impose an integrated and unified approach to the planning, coordination and evaluation of sectoral public investments aimed at regional development. In this aspect, coordination structures, both at central and regional level, need to be rethought and their tasks redefined on the basis of new institutional provisions. "A rational health management system has great potential, given the ageing populations of developed countries; it has the potential to reduce health inequalities between high- and low-income groups. It is not possible to select a specific smart settlement concept and simply

transfer it from one geographical region to another: smart infrastructure concepts must be tailored to local conditions and meet local development needs" [18].

Budget implementation consists of two main operations: commitment and payment. With regard to making commitments for payments to finance the health system, expenditures have been authorized and amounts due have been paid, whose share in total expenditures has increased by 3.8% over the period under review (Figure 3). The Government expects to increase expenditures on health care by 70-80 million rubles annually from GDP growth in Transnistria, representing 4.5% of GDP, but as the economy grows, in absolute terms, this 4.5% will be higher every year.

The distribution of financial means has a geometric progression: in 2022, 4.5% of 12 billion is one sum, and in 2023 4.5% of 12.5 billion is already a larger sum. The authors suggest planning somewhere between 70-80 million rubles annually to boost spending and to cover the most important expenditure items in health care. Another important area is the renovation of medical equipment. This budget line is to continue to be financed by an allocation of 1% of the single social tax (in recent years this has helped to purchase new CT scanners, X-ray and ultrasound machines, fluorography, etc.), but it needs to be increased to 1.5-2,5% so that modern information and communication systems can be enhanced. The authors note that the impacts of these actions are reflected in Table 1.

Table 2

Impacts and socio-economic effects of health system management on the left bank of the Dniester

The characteristic of impact	Benchmark shares
Reduction in the quality of healthcare services	Although healthcare spending has risen, it may not be sufficient to significantly improve the quality of services or meet the growing demands of the population, which could lead to reduced patient satisfaction and inefficiencies in the healthcare system.
Impact on life expectancy	Despite allocating a higher percentage of GDP to healthcare, inefficient resource management or poor implementation of public health measures could hinder the increase in life expectancy, especially in the face of external challenges such as pandemics or chronic diseases.
Reduction in the quality of healthcare services	Although healthcare spending has risen, it may not be sufficient to significantly improve the quality of services or meet the growing demands of the population, which could lead to reduced patient satisfaction and inefficiencies in the healthcare system.
Inequities in access to healthcare	Increased spending without equitable distribution of resources may deepen inequalities in access to healthcare, especially in less developed regions or among vulnerable groups, which could reduce the efficiency of the healthcare system and negatively affect the well-being of the population.
Dependence on external funding	If the national budget cannot support these expenditures, there is a risk of greater reliance on external aid, which can be unstable and may influence internal policies and the country's autonomy.
Public health risks	Declining access to adequate health care and prevention of treatment has led to an increase in chronic diseases and undiagnosed or untreated health problems, with a negative impact on public health in general.

The average share of financial resources allocated to the health system in the economy during the period under consideration was 4.55%. The sector's share of expenditure in

relation to GDP sharply increased in 2021 due to the COVID-19 pandemic and grew by 1.6% in 2022. However, in 2023, there was a decrease, which not only affected the life expectancy rate but also resulted in a reduction of the percentage of GDP allocated to healthcare expenditures. This shift highlights potential challenges in maintaining a balance between funding healthcare and achieving improved health outcomes for the population. Overall, these effects could undermine the long-term sustainability of the healthcare system and hinder the achievement of public health goals, including improving life expectancy and the quality of life of the population. This situation has shown the results of increased healthcare spending and the negative impact of poor management as a consequence. While the allocation of more funds to healthcare was intended to improve the system, inefficient management and improper allocation of resources have led to suboptimal outcomes, such as stagnation or even a decline in key health indicators like life expectancy, and a failure to fully address the healthcare needs of the population.

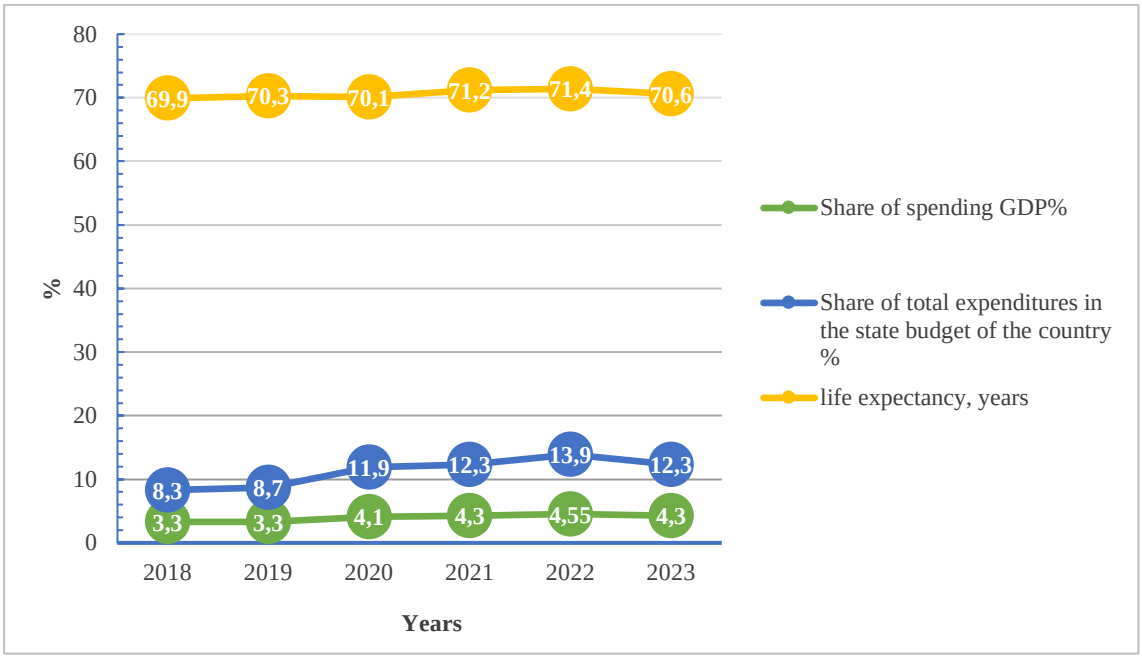

Figure 3. Evolution of the share of the left bank of the Dniester GDP expenditure on health care, 2018-2023, % [8,23].

Life expectancy at birth is 71.4 years in 2022, and 70.4 years in 2023. The 10-year increase in total population morbidity was 6.2% and primary morbidity 5.3%. The authors note that the higher the share of GDP allocations to health care in the context of the quality of health care services, the more likely the population's life expectancy increases. In 2023, a pilot project with elements of the Beveridge system was implemented in the healthcare system, in republican-type hospitals and at the mother and Child Center. As a positive effect, the salaries of medical staff were increased, but the quality of services and medical assistance left much to be desired. Prices for medical services rose by 100-250%. The population had unrealistic expectations, and for example, the health check-up for a child to be promoted to first grade cost 650 rubles (about $40). Prices became unrealistic, and the Ministry of Health's leadership focused on increasing profits rather than improving the quality of medical services. Thus, the effect of choice appeared in the healthcare system, with the population increasingly turning to private healthcare centers. The left bank of the Dnestr, a region affected by a severe economic blockade, was unable to generate sufficient revenue to support a sustainable state

budget. This economic isolation significantly impacted the region's ability to raise the necessary funds, leading to a budget deficit estimated at approximately 40% for the years 2023-2024.The imposed trade restrictions have limited access to international markets and external investments, significantly reducing revenue sources. As a result, the left bank of the Dniester faced major difficulties in covering public expenses and maintaining financial balance, becoming increasingly dependent on external resources and international aid. The authors mention that timely attention was not given to transitioning to the Bismarck system, which, if implemented alongside Moldova, would have introduced mandatory health insurance and could have supported the financial stability and sustainability of the healthcare system. Implementing this system would have ensured a more equitable and efficient financing of healthcare services, contributing to a stronger and more sustainable healthcare system in the long term. In contrast, the elements of the Beveridge healthcare system, used by countries such as Italy, Denmark, and the United Kingdom, etc., which have developed economies, ensure universal access to healthcare, supported by solid public policies and consistent financial resources. These countries effectively combine the delivery of high-quality medical services with health policies based on solidarity, having a well-regulated system that meets the needs of all citizens, regardless of their social or economic status. The authors believe that, on the left bank of the Nistru, this model will face difficulties in the future, with significant negative long-term impact. These challenges could severely affect the sustainability and efficiency of the healthcare system, creating substantial financial and administrative pressure, which would limit access to healthcare and reduce its quality. The authors emphasize that more than 40% of the total population is already burdening the healthcare system in Moldova. They concretely argue that it is necessary to strengthen healthcare systems to prevent a collapse in the public health sector in the Transnistrian region.

The authors propose the introduction of a compulsory health insurance system to retain financial resources in the region and regenerate them. This would increase expenditure on various items of health care, both in PHC and inpatient care facilities. The finances should work to improve the quality of health services, increase the salaries of health professionals and reduce the migration of young health professionals. The healthcare delivery has also to be rethought. In this paper, we try to highlight how the concepts of design thinking, participatory design and living lab can help to face these challenges in the healthcare field [20].

3. Results

One element of digitalization is innovative screening. Its application in health care, as a tool for diagnosing diseases, increases the effectiveness of treatment and is at the same time a method of regulating financial resources in health care, as it ensures maximum treatment results at minimum cost. The state invests specific resources in health care, in the implementation of prevention, diagnosis, treatment and rehabilitation, which are necessary for the implementation of these measures. In health care, this indicator reflects an index of population health, patient outcomes, patient satisfaction. The authors suggest that health care expenditure should be seen as an investment because it contributes to the health of the workforce and sustains their ability to work. Medical outcomes more often refer to specific patient outcomes, while social outcomes refer to public health indicators. In general, it can be stated that digitalization Transnistrian region is not an exception. The existing health care system is at an early stage of digital development. At the same time, this process contributes

to the growth of costs for the development of health care due to the training of personnel, acquisition of new innovative equipment for the introduction of new methods of diagnosis and research and as a result obtaining an accurate diagnosis and application of the correct methods of treatment. Treatment selection algorithm plays an important role in managing the treatment of disease and improving the quality of health services. The introduction of digitalization elements will make it possible to close a fairly wide range of tasks for a modern clinic, medical center, and private medical office. This direction is the most promising in terms of saving time and money for diagnosis, treatment and prevention for the population. It should be noted that the current systematic approach of the government to the concept of digitalization and coordination of this process is not yet at a high level in order to achieve synergy between the public, private and non-governmental sectors in the implementation of digital projects expected by society. The European concepts of «design thinking, collaborative design and the living lab can help address these health challenges» [20]. Digital technology is a modern tool for collecting and processing information, allowing the modern specialist to shorten the cycle of preventive diagnosis and treatment of patients [21]. Different trainings for trainers Transnistrian region retraining staff in "family medicine", organized by the EU-CFM Health Platform team, are taking place in the left bank of the Dniester. The event is part of the "Health Platform" project, implemented by the NGO "Association for Health and Sports" from Tiraspol, together with the NGO Association of Women and Children "NOVA" from Chisinau. The project “Improvement of medico-social care services for people with long-term care needs on both sides of the Dniester River” [22] is a three-year project funded by the European Union (EU) and co-financed by the Federal Ministry for Economic Cooperation and Development of Germany, under the general EU Confidence Building Measures Programmer (V) - Health sector modernization. The Project entails targeted aspects of confidence building on both banks of Dniester through participatory development, good governance and dialogue-promoting measures aimed at modernization of healthcare and social assistance services in the Transnistrian region. Results achieved: one Pilot Day Care Centre was established and operational; capacity development – approximately 700 professionals and non-professionals was trained; relevant regulatory framework assessed, developed, and piloted in the project area. Implementing Agencies: "Homecare" NGO; "Pro-Development" NGO; "Caritas" NGO, Czech Republic; Czech Development Agency; German Agency for International Cooperation. In order to improve the quality of the digital transformation of the health sector in the left bank of the Dniester, we propose for stakeholders, public administrations, business community and civil society organizations to consider for implementation in the Dniester River basin valley, the best European practices of the DESIRA project [23], for implementations within the activities of the EU-UNDP "Trans-River Health Platform"[24]. The EU Horizon 2020 "DESIRA" Programmer project, which ended in May 2023, developed the concept of socio-cyber-physical systems to better understand the impact of digitalization on rural areas, directly linking the analysis to the Sustainable Development Goals of the United Nations. Introducing an approach to responsible research and innovation, based on results of Project DESIRA, which attracted representatives of agriculture, forestry and rural areas to jointly develop scenarios and policies, researchers from innovative incubator IT4BA at the Academy of Economic Studies of Moldova, proposed to implementation European approach « Living Labs»[22]., in the local context urban and rural of Transnistrian region, which can be presented as innovative public-private partnership [25]. This approach established in 20 European regions, as well as a Rural Digitization Forum,

involving 250 stakeholders from across Europe. A virtual research environment adapted to the goals of the project connected all participants and significantly increased interaction within the network [26]. In the process of Open Science [27] and the research role of Open AIRE [25], the open exchange of information and knowledge plays a fundamental role. This was the basic idea behind the setup of Rural Digital Europe, the DESIRA Open AIRE [28] community dashboard. The Rural Digital Europe community brings together publications and research results related to digitalization and its socio-economic impact in three key DESIRA areas: rural areas, agriculture and forestry. Together with researchers from the Academy of Economic Studies of Moldova, the idea is to create a health data platform based on ArcGIS (ESRI) [1], to integrate it in the National Geoportal [30], and to complement these key areas. The DESIRA - Dashboard model, acts as a single access point for the research community, scientists and other stakeholders, facilitating their research and work. Innovative for the countries of the Eastern Partnership [27], the European Level Dashboard can be developed in a cross-border and cross-regional context. For example, members of the Euro region «Dniester» (Republic of Moldova and Ukraine) [25] and the Euro region «Siret-Prut-Dniester», RO (MD/RO) [29]. The «ArcGIS COVID-19 platform» [1] is a joint product of ESRI (USA) and the John Hopkins Institute (USA) and is currently used in over 100 countries worldwide to monitor the Coronavirus epidemic. It should be noted that the current governments systematic approach to the concept of digitalization and the coordination of this process is at a high level, which can create «synergies between R&I funding programmers» [30] which support implementation for all sectors of Transnistrian region local authority's economy, in frameworks smart specialization approach, where NGOs is operators of innovative public - private partnerships of digital projects expected by society». In the left bank of the Dniester, the "Health Train" pilot project has been implemented since 2022, targeting rural areas. A medical team consisting of a cardiologist, obstetrician-gynecologist, neurologist, ophthalmologist, and therapist travels to outpatient clinics in villages according to a set schedule, aiming to extend medical assistance over a wider area. This initiative effectively addresses the shortage of specialists in the health sector, providing vital care to underserved populations. Information about the project is shared on the department's website and social media, highlighting its importance and impact, particularly in rural areas where access to healthcare is more limited.

Integrating digitalization into this context can significantly contribute to improving structural efficiency, ongoing training for healthcare personnel, and increasing staff motivation within the healthcare system. Here's how digitalization can be integrated to address each of the three issues mentioned in Table 3.

Table 3

Some aspects the healthcare system in Transnistrian region through the lens of digitalization

Areas	Challenge	Digitalization Solutions:
Low Structural Efficiency of the Current Model	Underutilized resources in primary care and community healthcare facilities can be redistributed more efficiently through digitalization.	Telemedicine and Online Services: Implementing telemedicine platforms can reduce pressure on hospitals by providing remote consultations and medical care. This improves access to healthcare in rural or hard-to-reach areas and reduces the need for hospitalization.

Continuation Table 3

		Resource Management Platforms: Utilizing resource management software (such as scheduling, inventory management, and equipment tracking platforms) can optimize resource use in hospitals and community health centers, allocating them more efficiently where needed. Integrated Health Systems: Creating a digital integrated system that allows for quick information transfer between primary care units, hospitals, and specialty centers, improving patient care coordination.
Lack of Systematic Post-Graduate Training for Doctors	The lack of continuous education can be overcome through access to online learning platforms and digital resources.	Online Continuous Education Platforms: Developing digital platforms that offer courses, webinars, training sessions, and updates on specialized topics. These platforms can include interactive modules and practical case studies that help doctors stay up-to-date with the latest techniques and research. Virtual and Augmented Reality: Utilizing virtual and augmented reality technologies to simulate medical procedures and provide a safe, interactive learning environment for ongoing training for doctors. Digital Certification and Assessment: Creating a digital certification system to evaluate the progress and skills of doctors during their continuous education, ensuring high standards of professional competence.
Lack of Staff Motivation	The lack of incentives and an efficient recognition system can be addressed through digitalization, offering both rapid feedback and opportunities for professional growth.	Feedback and Recognition Platforms: Creating digital platforms where patients can provide feedback on the services they receive, and healthcare staff can be rewarded for their performance through positive evaluations. Employers can also use these platforms to offer rewards and public recognition. Mobile Apps for Psychological Support and Well-being: Implementing mobile applications that offer psychological support and stress management techniques for healthcare staff. These apps can help prevent burnout and improve work-life balance. Digital Performance Management Systems: Creating a digital system to track individual staff performance, providing continuous feedback and highlighting areas where improvement is needed. It could also include digital mentoring programs where experienced staff can guide and support younger colleagues.

By integrating digitalization into these three areas, the healthcare system can become more efficient, modern, and patient-centered while simultaneously improving working conditions and the ongoing professional development of healthcare staff.

4. Discussion

It should be noted that attention needs to be paid in the long term to increasing financing in health care. However, political control in recent years through its legislative/non-legislative activities has not always had a positive impact on budget implementation, which

could become an unresolved problem. Therefore, strengthening the capacity of the health care system to provide timely, universally accessible and quality services can be achieved through state regulation. Currently, the Semashko system (social insurance) is applied in the Transnistrian region and at the same time market instruments are also used. And in this context, the authors propose to introduce a system of compulsory health insurance for accumulation of financial means the left bank of the Dniester and, as a consequence, diversification and improvement of the quality of medical services. One of the current challenges is the COVID 19 pandemic, which has caused global economic collapse, but also created growth opportunities for IT companies through digitization of management and production processes, online communication and coordination, online service delivery (including education and medical advice), etc. Thus, we can see that, thanks to IT tools, the economic and social impact of the pandemic has been mitigated, which has mitigated the negative effects and ensured relative stability and economic sustainability. has the potential, the qualities to achieve a transformation towards a sustainable economy in general and healthcare that will ensure a better quality of life in the future. Thus, it is quite obvious that the serious problems faced by all mankind during the pandemic have reaffirmed the paramount importance of health, both for individuals and society as a whole.

5. Conclusions

In conclusion, the inefficient management of the health care system on the left bank of the Dniester has generated a number of negative socio-economic effects, affecting not only the health of the population, but also the economic sustainability of the region, creating inequalities and long-term challenges. The introduction of digital technologies and electronic charting into the health care system on the left bank of the Nistru River will be an important step towards its modernisation and efficiency, helping to overcome many obstacles. This process will eliminate existing inequalities in access to health services, ensuring a more equitable and transparent distribution of resources. It will also improve health information management, facilitating quick and accurate access to a patient's medical history and treatment. As a result, digitization will help increase life expectancy by streamlining the diagnosis and treatment process and enabling more efficient healthcare logistics.

Determinants such as rapid access to services, disease prevention and proper resource management will be much easier to track and monitor, helping to create a sustainable and high-performing healthcare. The authors believe that the development of the field of commercial medicine allows the growing needs of the population for high quality medical care to be met. This is achieved through the use of advanced technology and modern medical equipment, as well as the provision of services in comfortable conditions. At the same time, at the stage of development of paid medical care, the level of services provided does not differ much from that of state medicine. Commercial establishments often play an additional, and sometimes substitute, role in the provision of medical care to the population with the ability to pay. As a result, a competitive environment is emerging on the market for paid medical services, transforming the social insurance paradigm of medicine into an element of market relations and this is inevitable. The authors believe that only by strengthening health systems and implementing compulsory health insurance will it be possible to ensure social equity and the de facto right to quality health care. This approach will contribute directly to improving the quality of life and well-being of citizens by ensuring fairer and more efficient access to healthcare. Health determinants will be integrated into a system that promotes

prevention, appropriate treatment and continuous care. Working closely with local public authorities will support the implementation of these policies, ensuring not only physical health, but also an improvement in the living conditions and living standards of the population. In conclusion, the inefficient management of the health care system on the left bank of the Dniester has generated a number of negative socio-economic effects, affecting not only the health of the population, but also the economic sustainability of the region, creating inequalities and long-term challenges.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Babin, S.; Tutunaru, I.; Covalenco, I.; Babina, E. Some aspects of the formation of an innovation ecosystem for the sustainable development of smart villages in the Republic of Moldova. *Proceedings of the CEE eGov 2022 Conference*, 2022, p. 51. https://doi.org/10.1145/3551504.3551517
2. ArcGIS. Product overview. Available online: https://www.esri.com/en-us/arcgis/about-arcgis/overview (accessed on 12 October 2025).
3. Cauşan, C.; Gorobievschi, S.; Radu, G. Criteria and methods for ranking the world's countries by development health systems. *One Health & Risk Management*, 2022, p. 94. ISSN 2587-3458, e-ISSN 2587-3466.
4. Cauşan, C.; Gorobievschi, S.; Ivan, D.C. The development of e-health in the health system of the Republic of Moldova – a sustainability tool in the context of the implementation of European practices. In: *Proceedings of the Securing Smart Cities International Conference*, SNSPA Bucharest, Romania, 9–10 June 2023.
5. Costru, T.; Puia, R.; Buta, G.; Groppa, S.; Cojocaru, S.; Ungureanu, A.; Gorobievschi, S.; Vataman. *Register of Patients with COVID-19 Hospitalized in Public Medical Institutions in the Republic of Moldova*; Chișinău, 2022, p. 17.
6. DESIRA Project. Virtual Research Environments (VREs), D4Science Data Infrastructure. 2023. Available online: https://desira.d4science.org/explore (accessed on 12 October 2025).
7. DESIRA – OpenAIRE. Digitizing economic and social impacts in rural areas. 2021. Available online: https://www.openaire.eu/desira-rural-digital-europe-dashboard (accessed on 12 October 2025).
8. Digital Russia. *A new reality: Report of experts from the Digital McKinsey Group*; McKinsey & Company: Moscow, Russia, July 2017. Available online: https://www.mckinsey.com/~/media/McKinsey/Locations/Europe%20and%20Middle%20East/Russia/Our%20Insigs/Digital%20Russia/Digital-Russia-report.ashx (accessed on 12 October 2025).
9. Pérez, S.E.; Conte, A.; Harrap, N. Synergies between EU R&I funding programmes: Policy suggestions from the launching event of the Stairway to Excellence Project. *European Commission*, 2014. Available online: https://publications.jrc.ec.europa.eu/repository/handle/JRC92829 (accessed on 12 October 2025).
10. EU Commission. Open science: A policy priority for the European Commission. 2023. Available online: https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science_en (accessed on 12 October 2025).
11. EU4Digital. Bright future of possibilities for eHealth technology while some challenges remain. 2020. Available online: https://eufordigital.eu/bright-future-of-possibilities-for-ehealth-technology-while-some-challenges-remain/ (accessed on 12 October 2025).
12. EU-UNDP Moldova. *Support to Confidence Building Measures Programme (V)*. n.d. Available online: https://www.undp.org/moldova/projects/support-confidence-building-measures-programme-v (accessed on 12 October 2025).
13. European Federation of Pharmaceutical Industries and Associations (EFPIA). Digital health. 2023. Available online: https://www.efpia.eu/about-medicines/development-of-medicines/digital-health/#/ (accessed on 12 October 2025).
14. Euroregion «Dniester». Cross-border cooperation body between Ukraine and the Republic of Moldova. n.d. Available online: https://dniester.eu/ (accessed on 12 October 2025).
15. Euroregion Siret-Prut-Nistru. Cross-border cooperation platform (RO/MD). n.d. Available online: https://www.aebr.eu/members/euroregion-siret-prut-nistru-ro-md-ro/ (accessed on 12 October 2025).
16. Eurostat. What is the digital single market about? 2023. Available online: https://ec.europa.eu/eurostat/cache/infographs/ict/bloc-4.html (accessed on 12 October 2025).

17. Government of the Republic of Moldova. National Strategy "Health 2030" – Domain № 5: Digitized Health System. 2023. Available online: https://moldova1.md/p/11326/the-government-approved-the-national-strategy-health-2030-# (accessed on 12 October 2025).
18. Gorobievschi, S.; Costru, T.; Puia, R.; Ungureanu, A. Application of the quality of life concept in assessing the health status of post-COVID-19 patients in the Republic of Moldova. *Journal of Social Sciences* 2021, 4(3), pp. 79–88.
19. *Health Systems in Action: Republic of Moldova*. WHO Regional Office for Europe Report, 2022. Available online: https://eurohealthobservatory.who.int/publications/i/health-systems-in-action-republic-of-moldova-2022 (accessed on 12 October 2025).
20. Horizon Europe Project. *Digitization: Economic and Social Impacts in Rural Areas*; Università di Pisa, 2019–2023. Available online: https://cordis.europa.eu/project/id/818194 (accessed on 12 October 2025).
21. Kaushan, C.; Kaushan, T. Public health as a concept and its correlation in the context of increase in the quality of life. In: *Proceedings of the International Scientific-Practical Conference "Economic Growth in the Conditions of Globalization" (XVI ed.)*, NIER, Chișinău, Moldova, 12–13 October 2022.
22. Zanetti, M.; Nollo, G.; De Cecco, M. *Living Lab: An Innovative Approach in Healthcare*; University of Trento, 2024. Available online: https://event.unitn.it/smartcities-trento/Trento%20WP%20Zanetti%205%20LivingLab.pdf (accessed on 12 October 2025).
23. Ministry of Health of the Transnistrian Region. Statistical data and regional healthcare reports. 2023. Available online: http://minzdrav.gospmr.org/ (accessed on 12 October 2025).
24. Morozova, Y. Digital transformation of Russian health care as a factor in the development of the industry. *Innovations. Investments / Intellect. Innovations. Investments*, 2020, 2, pp. 37–44.
25. OpenAIRE. About OpenAIRE: Open scholarly communication infrastructure to support European research. 2023. Available online: https://www.openaire.eu/about (accessed on 12 October 2025).
26. Sandler, A. What do corporations and start-ups need to catch up on? Digital Health: An Innovation Event in Digital Medicine. 2018. Available online: https://blog.mednote.life/articles/digital-healthnnovacionnoe-meropriyatie-po-cifrovoy-medicine (accessed on 12 October 2025).
27. The eGov Moldova. The health sector will be the main focus of the digitalization process. n.d. Available online: https://www.egov.md/en/content/health-sector-will-be-main-focus-digitalization-process (accessed on 12 October 2025).
28. TrueConf. History of telemedicine. 2023. Available online: https://trueconf.ru/telemedicina.html (accessed on 12 October 2025).
29. UNDP Moldova. The sustainable development potential of 15 towns from both banks of the Nistru River was analyzed. 2018. Available online: https://www.undp.org/moldova/press-releases/sustainable-development-potential-15-towns-both-banks-nistru-river-was-analyzed (accessed on 12 October 2025).
30. World Health Organization (WHO) Regional Office for Europe. *Health Systems in Action: Republic of Moldova*; WHO: Copenhagen, Denmark, 2022. Available online: https://eurohealthobservatory.who.int/publications/i/health-systems-in-action-republic-of-moldova-2022 (accessed on 12 October 2025).

Citation: Kaushan, C.; Gorobievschi, S.; Radu, Gh.; Babin, A. Digitalisation of the Transnistrian region health system as a regional component in the Dniester river ecosystem. Journal of Social Sciences, 8 (4), pp. 187-201. https://doi.org/10.52326/jss.utm.2025.8(4).12.

Publisher's Note: JSS stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Submission of manuscripts: *jes@meridian.utm.md*