

Letunovska, Nataliia; Demchyshak, Nazar; Minchenko, Mariia et al.

## Article

# Management of country's social brand under conditions of uncertainty in the health domain

**Reference:** Letunovska, Nataliia/Demchyshak, Nazar et. al. (2023). Management of country's social brand under conditions of uncertainty in the health domain. In: Marketing i menedžment innovacij 14 (2), S. 10 - 18.

[https://mmi.sumdu.edu.ua/wp-content/uploads/2023/07/%D0%90695-2023\\_02\\_Letunovska-et-al-1.pdf](https://mmi.sumdu.edu.ua/wp-content/uploads/2023/07/%D0%90695-2023_02_Letunovska-et-al-1.pdf).

doi:10.21272/mmi.2023.2-02.

This Version is available at:

<http://hdl.handle.net/11159/631401>

## Kontakt/Contact

ZBW – Leibniz-Informationszentrum Wirtschaft/Leibniz Information Centre for Economics  
Düsternbrooker Weg 120  
24105 Kiel (Germany)  
E-Mail: [rights\[at\]zbw.eu](mailto:rights[at]zbw.eu)  
<https://www.zbw.eu/econis-archiv/>

## Standard-Nutzungsbedingungen:

Dieses Dokument darf zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden. Sie dürfen dieses Dokument nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, aufführen, vertreiben oder anderweitig nutzen. Sofern für das Dokument eine Open-Content-Lizenz verwendet wurde, so gelten abweichend von diesen Nutzungsbedingungen die in der Lizenz gewährten Nutzungsrechte.

<https://zbw.eu/econis-archiv/terms-of-use>

## Terms of use:

*This document may be saved and copied for your personal and scholarly purposes. You are not to copy it for public or commercial purposes, to exhibit the document in public, to perform, distribute or otherwise use the document in public. If the document is made available under a Creative Commons Licence you may exercise further usage rights as specified in the licence.*

## MANAGEMENT OF COUNTRY'S SOCIAL BRAND UNDER CONDITIONS OF UNCERTAINTY IN THE HEALTH DOMAIN

**Nataliia Letunovska,**  ORCID: <https://orcid.org/0000-0001-8207-9178>

Ph.D., Associate Professor, Sumy State University, Ukraine

**Nazar Demchyshak,**  ORCID: <https://orcid.org/0000-0001-6852-7405>

Dr.Sc., Professor, Ivan Franko National University of Lviv, Ukraine

**Mariia Minchenko,**  ORCID: <https://orcid.org/0000-0002-6768-1627>


Ph.D., Associate Professor, Sumy State University, Ukraine

**Petra Kriskova,**  ORCID: <https://orcid.org/0000-0003-1516-1862>

Ph.D., Assistant Professor, University of Economics in Bratislava, Slovakia

**Mariia Kashcha,**  ORCID: <https://orcid.org/0000-0001-9055-8304>

Sumy State University, Ukraine

**Anna Volk,**  ORCID: <https://orcid.org/0009-0000-6854-1776>

Sumy State University, Ukraine

**Corresponding author:** Nataliia Letunovska, [n.letunovska@kmm.sumdu.edu.ua](mailto:n.letunovska@kmm.sumdu.edu.ua)

**Type of manuscript:** research paper

**Abstract:** *The coronavirus pandemic confirmed that national systems of medical and social provision for the population of various countries could not quickly adapt and implement effective measures to prevent the negative consequences from achieving a state of resilience. The article empirically substantiates the impact of the COVID-19 pandemic on national social brand to form effective mechanisms for countering risks in public health and supporting the social brand of the country for its main internal stakeholders in a period of uncertainty. The article is devoted to analyzing the channels through which the COVID-19 pandemic affected various aspects of the national management systems of Austria, Slovenia, France, and Ukraine. The analysis used a combination of correlation analysis, causal modeling, and the construction of cognitive maps to visualize dependencies. It was revealed that the key indicators that verify the mentioned impact are the satisfaction of the needs for medical examination and care, the availability of hospital beds in the medical system, and the general costs of social protection of the population. The indicator of the social attractiveness of the country for its internal stakeholders is the indicator of net migration, and it is empirically determined that this indicator is significantly influenced by the security of the medical system and the efficiency of its functioning, especially during the period of data analysis, taking into account the existence of the COVID-19 pandemic. The dependence between the social and economic well-being of the population and its tendency to critically assess one's health, readiness for disease prevention, and the formation of higher requirements for medical care was revealed. The determined regularities are useful in developing a national strategy for building an effective medical and social security system for the population in conditions of uncertainty, which is a significant component of the overall attractiveness of the country and its brand management.*

**Keywords:** country brand, internal stakeholders, international benchmarking, national management resources, COVID-19.

**JEL Classification:** A13, M38, O57

**Received:** 19 January 2023

**Accepted:** 10 June 2023

**Published:** 30 June 2023

**Funding:** This research was funded by the Ministry of Education and Science of Ukraine, grant numbers 0122U000781 «The impact of COVID-19 on the transformation of the medical and social security system: economic, financial and budgetary, institutional and political determinants»; 0122U000778 «Socio-economic recovery after COVID-19: modeling the consequences for macroeconomic stability, national security, and community resilience».

**Publisher:** Academic Research and Publishing UG, Germany.

**Founder:** Sumy State University and Academic Research and Publishing UG (i.G.), Germany.

**Cite as:** Letunovska, N., Demchyshak, N., Minchenko, M., Kriskova, P., Kashcha, M., & Volk, A. (2023). Management of Country's Social Brand Under Conditions of Uncertainty in the Health Domain. *Marketing and Management of Innovations*, 2, 10–18. <https://doi.org/10.21272/mmi.2023.2-02>



Copyright: © 2023 by the author. This article is an open-access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

**Introduction.** The corona crisis has become a unique challenge for national medical and social security systems. Health threats have been combined with risks of poverty and negative social consequences due to anti-epidemic measures. At the height of the pandemic, the state's essential role in preventing the spread of the virus and its negative consequences for society's economic and social life has been demonstrated worldwide. At the same time, the role of the social component of politics as a macroeconomic stabilizer has significantly increased during the impact of the COVID-19 pandemic. In fact, during the pandemic period and the period of post-crisis recovery, the world economy moved from the «profit economy» model to the «care economy» model, when it was the care that became the key element capable of maintaining the level of national security through such components as child care, motherhood, care for elderly people, care for the sick people, rehabilitation measures (treatment of chronic pain, exacerbations of chronic diseases, complications after contracting the coronavirus, etc.). The global pandemic confirmed that the established national medical and social provision systems were unable to quickly adapt and implement effective measures to prevent the negative consequences of the coronavirus. Because of the above, the empirical substantiation of the impact of COVID-19 on the national socio-economic development and the medical and social security system to form effective mechanisms for eliminating the negative consequences of risks in public health is relevant.

**Literature Review.** Many scientists emphasize that the high number of infections and deaths from coronavirus, as well as economic difficulties, and uncertainty about the future play a decisive role in the impact of COVID-19 on the social sphere (Osofsky et al., 2020). Akbulaev et al. (2020) emphasized that the coronavirus pandemic has undermined the global economy, affecting, in addition, health, the environment, and the social sphere. Therefore, the authors of this work consider the issue of this impact comprehensively through the analysis of the effectiveness of the countries' initiatives to overcome the consequences. Bokern et al. (2021) investigated risks, uncertainty, and social attitudes of the population during the pandemic period. They summarize their research by identifying how the crisis affected individuals' preferences and identifying cause-and-effect relationships. The study also pays attention to the economic consequences and the attitude of business entities to risks during the pandemic. Lipskaya-Velikovsky (2021) emphasizes that pandemics cause long-term secondary health effects that have been understudied. The author examines the factors that underlie the quality of life during quarantine, pointing out that its decrease increases the population's vulnerability to the pandemic's secondary impact. Wójcicki (2022) confirms his hypothesis that the economic consequences of the COVID-19 pandemic are secondary to the social consequences, which distinguishes the corona crisis from other crisis states of a financial and economic nature. During the coronavirus pandemic, social factors – the health care system and education – played an important role in overcoming the crisis. Zelinska et al. (2021) devoted their work to the analysis of risks in the social sphere and their impact on the development of society. Their research showed the greatest strength of risks in the labor sphere and the health care system. Their conclusions relate to the fact that education and knowledge could activate innovative changes and reduce the negative impact of social threats. The main goal of the work (Fandrejewska et al., 2022) was to determine the impact of globalization and information and communication technologies on the behavioral patterns of the young population during the COVID-19 pandemic. Novikova et al. (2021) described the socioeconomic consequences of the COVID-19 pandemic, which arose due to the unpreparedness of national healthcare systems to counter the spread of the virus: a decrease in production and income of enterprises, a drop in real GDP. These economic consequences have increased the intensity and manifestation of negative social consequences: unemployment, social inequality, a drop in income, and social security. Zhang et al. (2022) investigated the direct and indirect impact of the COVID-19 pandemic on the development of countries was. The authors focus their research on analyzing the volume of labor movement between countries and the limitation in the volume of remittances of migrants during the pandemic. The work (Rosokhata et al., 2020) is devoted to the same research subject. Empirical research has shown that COVID-19 has changed the structure of spending by households in Ukraine and has generally changed preferences in consumer behavior. Vasylieva et al. (2020) summarize the arguments and counter-arguments regarding the definition and justification of financial, socioeconomic, and environmental patterns and public health factors for forming road maps for measures to limit the spread of the pandemic. Kuzmenko et al. (2020) continued the study of groups of determinants of territories' vulnerability to the coronavirus. Economic, environmental, social, and health factors are considered in this work. Socio-behavioral aspects of the population's life have been studied in the works of several scientists, for example (Aydin & Ungan, 2023). The authors have already studied behavioral patterns of the population in healthy consumption in previous studies (Letunovska et al., 2021; Letunovska and Boliukh, 2023). The studies (Li et al., 2019; Jiroudkova et al, 2015; Stojanov et al., 2011; Lu et al., 2019a; Strielkowski & Hoshle, 2016; Lu et al., 2018b; Cabelkova et al., 2015; Chaouali et al., 2023) focused on the important social problems related to the formation and management policy of

national attractiveness. These are studies on changes in population patterns in understanding the country's attractiveness, the study of those factors that affect social security and equality nationally. There is not enough research on the verification of the main channels through which the impact of the pandemic on various aspects of social life took place and the search for those factors that determine the level of attractiveness of the country during the period under the influence of the pandemic.

**Methodology and research methods.** In order to develop a model that will help identify the main channels through which the COVID-19 pandemic affects the population's medical and social security system, three EU countries were selected as the object of the study, in which the largest number of cases of infection with COVID-19 was registered per 1 million of the existing population (as of 01/03/2023) (according to the data of (COVID-19, 2023) – Austria, Slovenia, France and Ukraine. When choosing such a criterion, the hypothesis was used to identify the main channels through which the COVID-19 pandemic affects it will be easier for the system of medical and social security if the country suffered greater losses from the pandemic, and in the rest of the countries, the situation will be similar only on a smaller scale.

The Gini coefficient (scale from 0 to 100, the higher, the greater the inequality), social protection expenditures (% of GDP), level of net migration (the difference between the number of immigrants and the number of emigrants), level of unemployment (% of the population in the labor force) and household savings (% of household disposable income). For research of the medical field: the unsatisfied need for medical examination and care (% of the population), beds in hospitals (per 100,000 inhabitants), total health care costs (million euros), immunization, DPT (% of children aged 12-23 months), life expectancy at birth, total (years) (World bank, 2023; Eurostat, 2023). A time range of 12 years has been chosen: from 2010 to 2021. The data are divided into two cross-sectional intervals: 1) 2010-2019 to study relationships in the period without the impact of the pandemic; 2) 2012-2021 with coverage of the distorted data by the pandemic, to identify the main channels through which the COVID-19 pandemic affects the system of medical and social security when comparing the two results.

To achieve the goal, the following sequence of actions was chosen for each set of values separately:

- 1) collection and processing of statistical data;
- 2) analysis of the closeness and nature of relationships between the studied quantities;
- 3) application of causal modeling to identify cause-and-effect relationships taking into account the lag;
- 4) construction of a cognitive map in the language of sign oriented graphs (FCM analysis);
- 5) comparison of the obtained results for two separate samples and summarizing the results of the study.

Using the correlation matrix calculation, it is possible to find the weighting coefficients indicating the influence of the indicators on each other, which will take values from the interval  $[-1; 1]$ , where the negative value of the weighting coefficient means the inverse relationship between the factors, i.e. when the first factor increases (decreases), the second factor will decrease (increase); a positive value of the weight coefficient means a direct relationship between the factors, i.e. an increase (decrease) of the first factor will increase (decrease) of the second; a zero value of the weight coefficient means no relationship. The strength of the connection between the  $i$ -th and  $j$ -th factors will be expressed by the value  $v_{ij}$ , where the value  $0.8 < |v_{ij}| \leq 1$  will correspond to a very strong connection,  $0.6 < |v_{ij}| \leq 0.8$  – strong connection,  $0.4 < |v_{ij}| \leq 0.6$  – moderate,  $0.2 < |v_{ij}| \leq 0.4$  – weak,  $0 < |v_{ij}| \leq 0.2$  – very weak. The results obtained at this stage will be used to construct a cognitive map using a directed graph (FCM analysis) to determine the strength and nature of relationships.

Causal modeling was used to identify the presence of a relationship, which will help to determine which indicator is likely to be the cause and which is the consequence and to find out whether such a relationship is statistically significant. The Granger test was chosen as the method, which, taking into account the lag, will help draw conclusions and determine the direction of the arrow between two factors if there is a relationship between them. This test must be performed for each country participating in the study, separately for each stage (pre-pandemic and post-pandemic) and for each pair of ten indicators, i.e.  $45 \cdot 2 \cdot 4 = 360$  times.

By summarizing the results of steps 2 and 3, it becomes possible to build a fuzzy cognitive map (FCM) to identify the main channels through which the COVID-19 pandemic affects the national medical and social security systems. The oriented graph makes it possible to describe and demonstrate which connections between indicators of the medical and social spheres have undergone the greatest changes under the influence of the pandemic. To build the FCM model, it is necessary to: 1) select concepts - Gini coefficient (Gini), social protection costs (Soc\_prot), net migration rate (Net\_migr), unemployment rate (UnEmp), household savings (House\_sav), unsatisfied need for medical examination and care (Unmet), hospital beds in hospitals (Beds), total health care expenditure (Tot\_Health), immunization, DPT (Immun), life expectancy at birth, total

(Life\_Exp); 2) select criteria and determinate relationships between concepts – the presence of a statistically significant cause-and-effect relationship according to the Granger test and the character according to the pair correlation value (Poczeta et al., 2019).

**Results.** Tables 1-4 were obtained due to calculating the closeness and nature of relationships between the studied values in the period without considering the pandemic. Similar tables are built for data considering the pandemic's impact. In this case, they have differences.

**Table 1. Weight coefficients of the closeness of the relationship of indicators of medical and social security in the pre-pandemic period for Austria**

	Gini	Soc_Prot	Net_Migr	UnEmp	House_sav	Immun	Life_exp	Beds	Tot_health	Unmet
<b>Gini</b>	1.00									
<b>Soc_Prot</b>	-0.02	1.00								
<b>Net_Migr</b>	-0.51	0.6	1.00							
<b>UnEmp</b>	-0.38	0.43	0.65	1.00						
<b>House_sav</b>	0.66	-0.42	-0.72	-0.43	1.00					
<b>Immun</b>	-0.11	0.86	0.57	0.25	-0.55	1.00				
<b>Life_exp</b>	-0.74	-0.39	0.16	0.26	-0.38	-0.19	1.00			
<b>Beds</b>	0.71	0.6	-0.11	-0.17	0.26	0.4	-0.93	1.00		
<b>Tot_health</b>	-0.74	-0.57	0.13	0.15	-0.28	-0.37	0.94	-1.00	1.00	
<b>Unmet</b>	0.65	-0.05	-0.62	-0.59	0.68	-0.26	-0.69	0.61	-0.61	1.00

Sources: developed by the authors using STATISTICA program software.

**Table 2. Weight coefficients of the closeness of the relationship of indicators of medical and social security in the pre-pandemic period for Slovenia**

	Gini	Soc_Prot	Net_Migr	UnEmp	House_sav	Immun	Life_exp	Beds	Tot_health	Unmet
<b>Gini</b>	1.00									
<b>Soc_Prot</b>	0.85	1.00								
<b>Net_Migr</b>	-0.64	-0.69	1.00							
<b>UnEmp</b>	0.69	0.8	-0.66	1.00						
<b>House_sav</b>	-0.65	-0.51	0.52	-0.8	1.00					
<b>Immun</b>	0.83	0.78	-0.5	0.43	-0.35	1.00				
<b>Life_exp</b>	-0.67	-0.87	0.36	-0.45	0.11	-0.77	1.00			
<b>Beds</b>	0.65	0.81	-0.3	0.39	-0.08	0.76	-0.95	1.00		
<b>Tot_health</b>	0.2	0.27	-0.57	-0.08	0.18	0.45	-0.25	0.35	1.00	
<b>Unmet</b>	-0.85	-0.88	0.54	-0.84	0.65	-0.68	0.65	-0.66	-0.05	1.00

Sources: developed by the authors using STATISTICA program software.

**Table 3. Weight coefficients of the closeness of the relationship of indicators of medical and social security in the pre-pandemic period for France**

	Gini	Soc_Prot	Net_Migr	UnEmp	House_sav	Immun	Life_exp	Beds	Tot_health	Unmet
<b>Gini</b>	1.00									
<b>Soc_Prot</b>	-0.32	1.00								
<b>Net_Migr</b>	0.95	-0.35	1.00							
<b>UnEmp</b>	-0.09	0.91	-0.09	1.00						
<b>House_sav</b>	0.9	-0.58	0.88	-0.39	1.00					
<b>Immun</b>	0.81	0.11	0.83	0.3	0.66	1.00				
<b>Life_exp</b>	-0.89	0.17	-0.89	-0.15	-0.7	-0.79	1.00			
<b>Beds</b>	0.8	0.22	0.82	0.47	0.57	0.94	-0.84	1.00		
<b>Tot_health</b>	-0.9	-0.02	-0.92	-0.28	-0.71	-0.93	0.89	-0.98	1.00	
<b>Unmet</b>	0.47	0.4	0.52	0.43	0.39	0.84	-0.37	0.75	-0.69	1.00

Sources: developed by the authors using STATISTICA program software.

Similar calculations were carried out for four countries during the period taking into account the impact of the pandemic, the results of which will determine the strength of the connection and its direction (direct or inverse). At the next stage, a Granger test was performed for four countries to establish cause-and-effect relationships between the variables of the medical and social spheres in the pre-pandemic period, a fragment of which is shown in Table 5. Other results were considered when constructing a cognitive map of the interaction of medical and social indicators in the pre-pandemic period.



**Table 4. Weight coefficients of the closeness of the relationship of indicators of medical and social security in the pre-pandemic period for Ukraine**

	Gini	Soc_Prot	Net_Migr	UnEmp	House_sav	Immun	Life_exp	Beds	Tot_health	Unmet
<b>Gini</b>	1.00									
<b>Soc_Prot</b>	0.42	1.00								
<b>Net_Migr</b>	-0.14	-0.23	1.00							
<b>UnEmp</b>	-0.08	-0.17	0.78	1.00						
<b>House_sav</b>	0.09	0.15	-0.93	-0.83	1.00					
<b>Immun</b>	0.55	0.00	0.67	0.59	-0.73	1.00				
<b>Life_exp</b>	0.64	0.21	-0.49	-0.72	0.47	0.08	1.00			
<b>Beds</b>	-0.45	-0.14	0.75	0.81	-0.75	0.26	-0.87	1.00		
<b>Tot_health</b>	0.11	-0.28	0.74	0.65	-0.86	0.83	-0.14	0.48	1.00	
<b>Unmet</b>	-0.7	-0.37	0.3	0.29	-0.43	-0.05	-0.5	0.58	0.47	1.00

Sources: developed by the authors using STATISTICA program software.

**Table 5. Results of the Granger test for medical and social indicators of the analyzed countries in the pre-pandemic period (fragment)**

The hypothesis being tested	Austria		Slovenia		France		Ukraine	
	F-Stat	Prob.	F-Stat	Prob.	F-Stat	Prob.	F-Stat	Prob.
Immun does not cause Beds	1.07	0.45	0.63	0.59	2.63	0.22	1.89	0.29
Beds do not cause Immun	24.24	0.01	1.93	0.29	1.08	0.44	0.58	0.61
House_sav does not cause Gini	0.97	0.47	0.78	0.53	1.06	0.45	2.99	0.19
Gini does not cause House_sav	0.51	0.65	2.14	0.27	0.22	0.82	1.34	0.38
Net_Migr does not cause Immun	0.43	0.68	0.81	0.53	2.85	0.2	0.09	0.92
Immun does not cause Net_Migr	13.57	0.03	1.87	0.3	5.58	0.09	0.12	0.89
Unmet does not cause Net_Migr	0.72	0.55	0.07	0.93	12.24	0.04	2.41	0.24
Net_Migr does not cause Unmet	0.22	0.81	2.76	0.21	0.99	0.47	33.8	0.01
Tot_health does not cause Soc_Prot	1.09	0.44	0.97	0.47	2.98	0.19	3.75	0.15
Soc_Prot does not cause Tot_health	0.11	0.9	4.64	0.12	0.81	0.52	6.03	0.09

Sources: developed by the authors using STATISTICA program software.

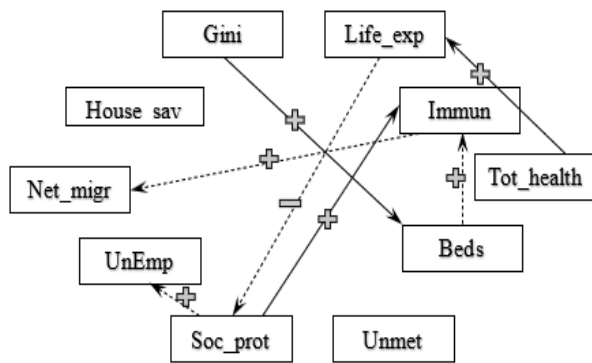
Similar calculations were made to analyze the change in interdependencies between indicators during the period considering the pandemic, Table 6.

**Table 6. Results of the Granger test for medical and social indicators of the analyzed countries in the period taking into account the impact of the COVID-19 pandemic (fragment)**

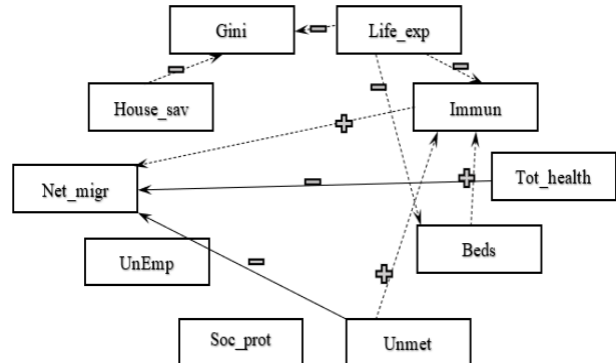
The hypothesis being tested	Austria		Slovenia		France		Ukraine	
	F-Stat	Prob.	F-Stat	Prob.	F-Stat	Prob.	F-Stat	Prob.
Immun does not cause Beds	0.46	0.67	4.7	0.12	1.82	0.31	5.05	0.11
Beds do not cause Immun	50.49	0.01	17.98	0.02	0.33	0.74	4.27	0.13
House_sav does not cause Gini	10.67	0.04	1.46	0.36	1.51	0.35	32.51	0.01
Gini does not cause House_sav	1.48	0.36	1.95	0.29	1	0.46	19.53	0.02
Net_Migr does not cause Immun	0.63	0.59	2.37	0.24	0.52	0.64	5.94	0.09
Immun does not cause Net_Migr	14.71	0.03	0.96	0.48	1.33	0.39	78.45	0.00
Unmet does not cause Net_Migr	7.6	0.07	0.05	0.95	0.29	0.77	0.92	0.49
Net_Migr does not cause Unmet	0.61	0.6	4.24	0.13	3.78	0.15	9	0.05
Tot_health does not cause Soc_Prot	0.23	0.81	1.45	0.36	0.2	0.83	0.88	0.5
Soc_Prot does not cause Tot_health	1.36	0.38	5.24	0.11	9.66	0.05	0.16	0.86

Sources: developed by the authors using STATISTICA program software.

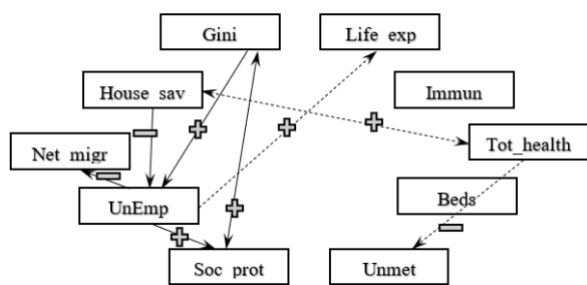
Preliminary calculations make it possible to build a graphic map of the relationships between the elements of medical and social security for four countries in two periods of analysis (Fig. 1).



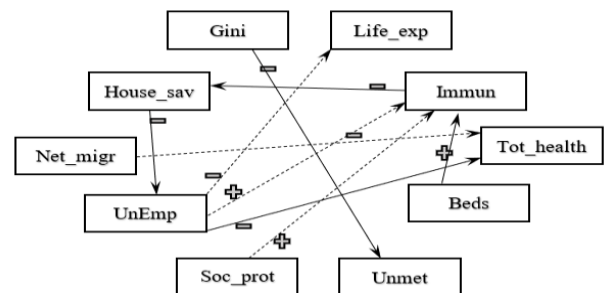
Austria (in the pre-pandemic period)



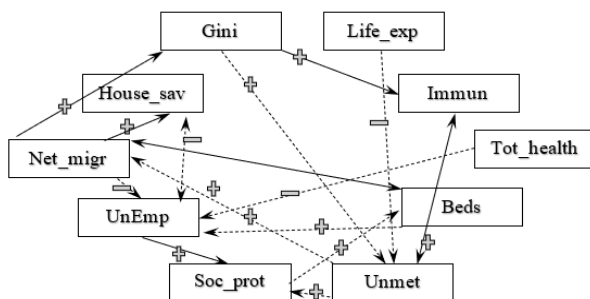
Austria (during the period taking into account the COVID-19 pandemic)



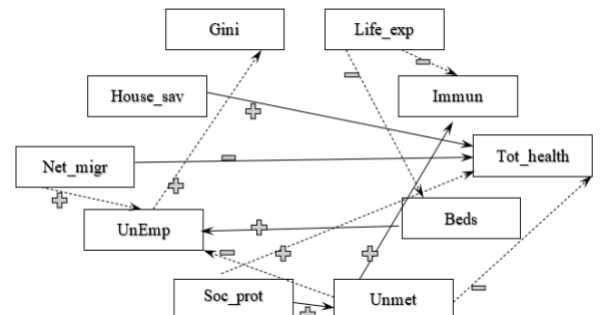
Slovenia (in the pre-pandemic period)



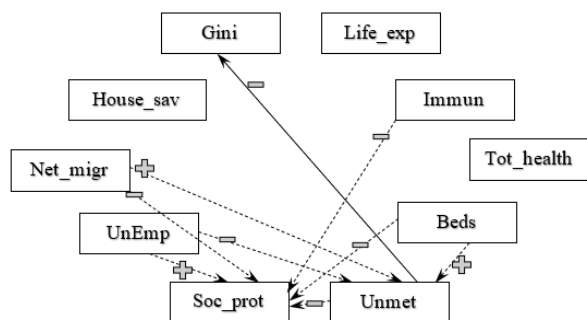
Slovenia (during the period taking into account the COVID-19 pandemic)



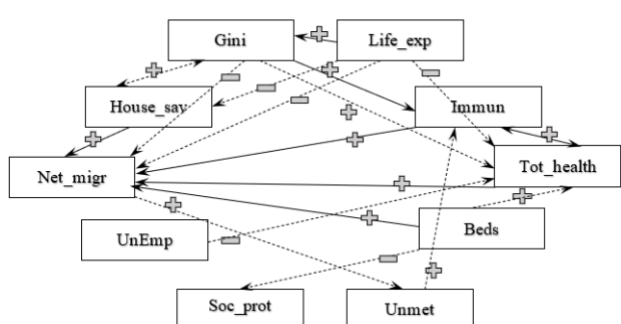
France (in the pre-pandemic period)



France (during the period taking into account the COVID-19 pandemic)



Ukraine (in the pre-pandemic period)



Ukraine (during the period taking into account the COVID-19 pandemic)

**Figure 1. Comparison of interrelationships between medical and social security variables**  
Sources: developed by the authors.

In Figure 1, the presence or absence of an arrow between elements indicates the presence or absence of a causal relationship, respectively. The beginning of the arrow shows the cause element and the end shows the effect element. The cause-and-effect relationship exists in both directions if the arrow has two ends. The arrow sign indicates whether the relationship is direct (if positive) or inverse (if negative). A solid arrow indicates the presence of a strong or very strong connection, and a dashed one indicates a medium, weak, or very weak connection.

In Austria, the relationship between such an indicator as population immunization and the volume of net migration is direct both before and when analyzing the indicators considering the pandemic's impact. If, before the pandemic, the indicator of net migration was affected only by this indicator, then after taking into account the factor of the pandemic, the dependence of net migration on the amount of health care expenses and the number of unmet needs in medicine could also be traced. As dissatisfaction with receiving medical services grew, the net migration rate fell. In the post-pandemic period, the growth of household savings led to a fall in the Gini index, and thus to a decrease in inequality in society. Notably, before the pandemic, there was a fairly strong relationship between social protection spending and population immunization. Better social security for the population leads to their higher readiness and desire to care for their health. In the post-pandemic period, other indicators are decisive for this, among them, probably, reorganization in the health care system (for example, the increase in the number of hospital beds points to this). The connection between other elements of the analysis was not strong, so there is no need to consider the dependencies between them as those that caused the change in others. An analysis of the same periods in Slovenia showed that before the pandemic, the increase in unemployment led to a decrease in the net migration of the population as an indicator of the country's attractiveness. In turn, the Gini index significantly influenced the unemployment rate (when it increases, the unemployment rate increases). A strong relationship was found between the amount of household savings and the level of unemployment, which is inverse. The relationship of sufficient power of influence is revealed between the Gini index and the expenditure on social protection of the population. In the post-pandemic period, a strong relationship between the Gini index and unmet needs for health services was found, with healthcare dissatisfaction falling as the inequality index increased. It follows that economically more favorable living conditions cause the population to be more picky about the conditions for providing medical care. In France, there was a strong association between population immunization and health care satisfaction and examination needs in the pre-pandemic period. The growth of net migration shows a direct relationship with the amount of household savings. In the post-pandemic period, the indicator of net migration shows a drop in other indicators. Still, on the other hand, there are no direct connections with other indicators that would cause a rise or fall in the country's attractiveness indicator. For Ukraine, it was determined that in the pre-pandemic period, only one pair of variables with a strong connection was traced – the unsatisfied need for medical examination and care, the growth of which was accompanied by an increase in the Gini coefficient of inequality (the higher the Gini coefficient, the greater the inequality in society). Paired with the variables unemployment rate and social protection expenditures, the inverse relationship between the level of net migration and social protection expenditures, and the inverse relationship between the unemployment rate and the unmet need for medical examination and care were found to be lower in the strength of the relationship. Notably, the increase in the supply of hospital beds did not improve the satisfaction indicator with the need for medical care. The analysis taking into account the impact of the pandemic showed the presence of a significantly greater number of dependencies between variables, among which the strongest relationship is observed between pairs of variables, among which the effect is the level of net migration (the difference between the number of immigrants and emigrants). The growth of this indicator (attractiveness of the country) is influenced by indicators of financing the health care system, improving the provision of the medical system (supply of hospital beds), and the effectiveness of vaccination campaigns (DTP immunization). Among the indicators of the social sphere, it is noteworthy that when analyzing the impact of the pandemic, a bidirectional relationship appears between household savings and the Gini coefficient of inequality.

**Conclusions.** Thus, the analysis of the causal relationships between the elements of the medical and social systems in the period before the pandemic and after the start of the COVID-19 pandemic for four countries made it possible to reveal certain patterns and, therefore, to identify the probable channels through which COVID-19 affected the system medical and social security of the population and attractiveness of countries as a whole. The key indicators that verify this impact are the satisfaction of the needs for medical examination and care, provision of hospital beds, and spending on social protection. It was found that the country's attractiveness, expressed through the amount of net migration during the pandemic, largely depends on the availability of the medical system and the efficiency of its functioning. Several useful dependencies for further development were also revealed, namely, that people who are more socially and economically well-off tend



to approach health issues more critically – its prevention (immunization) and making demands for medical care (satisfaction of medical needs examination and care). Further research will be aimed at developing a road map for building the most effective medical and social security system for the population in terms of threats to public health to increase the country's attractiveness to its internal stakeholders.

**Author Contributions:** conceptualization, N. L., N. D. and M. K.; methodology, M. K. and P. K.; software, M. K.; validation, N. L. and M. K.; formal analysis, M. K.; investigation, N. L. and N. D.; resources, N. L. and M. M.; data curation, N. L., M. M. and A. V.; writing-original draft preparation, N. L., M. M. and A. V.; writing-review and editing, N. L. and P. K.; visualization, M. K.; supervision, N. L.

**Conflicts of Interest:** Authors declare no conflict of interest.

**Data Availability Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

## References

- Akbulaev, N., Mammadov, I., & Aliyev, V. (2020). The economic impact of COVID-19. *Sylwan*, 164(5). [\[Google Scholar\]](#) [\[CrossRef\]](#)
- Aydin, S. & Ungan, M (2023). Contribution to industrial buyer behavior model: An empirical research. *Marketing and Management of Innovations*, 1, 235-253. [\[Google Scholar\]](#) [\[CrossRef\]](#)
- Bokern, P., Linde, J., Riedl, A., & Werner, P. (2021). The effect of the COVID-19 crisis on economic and social preferences. Retrieved from [\[Link\]](#)
- Cabelkova, I., Strielkowski, W., & Mirvald, M. (2015). Business influence on the mass media: A case study of 21 countries. *Transformations in Business & Economics*, 14(1), 65-75. [\[Google Scholar\]](#)
- Chaouali, I., Ben Jebli, M., & Strielkowski, W. (2023). How renewable energy and service growth influence environmental quality: Evidence from a sustainable development perspective. *Natural Resources Forum*, 47(2), 257-275. [\[Google Scholar\]](#)
- COVID-19. Worldometer (2023). Retrieved from [\[Link\]](#)
- Eurostat (2023). Retrieved from [\[Link\]](#)
- Fandrejewska, A., Chmielarz, W., & Zborowski, M. (2022). The Impact of the COVID-19 Pandemic on the Perception of Globalization and Consumer Behavior. *Sustainability*, 14(15), 9575. [\[Google Scholar\]](#) [\[CrossRef\]](#)
- Jiroudkova, A., Rovna, L., Strielkowski, W., & Slosarcik, I. (2015). EU accession, transition and further integration for the countries of Central and Eastern Europe. *Economics and Sociology*, 8(2), 11-25. [\[Google Scholar\]](#) [\[CrossRef\]](#)
- Kuzmenko, O., Vasylieva, T., Vojtovič, S., Chygryn, O., & Snieška, V. (2020). Why do regions differ in vulnerability to Covid-19? Spatial nonlinear modeling of social and economic patterns. *Economics and Sociology*, 13(4), 318-340. [\[Google Scholar\]](#)
- Letunovska, N., & Boliukh, V. (2023). Country's vulnerability to COVID-19 depending on the health behaviour patterns of the population. *Health Economics and Management Review*, 4(1), 103-112. [\[Google Scholar\]](#) [\[CrossRef\]](#)
- Letunovska, N., Yashkina, O., Saher, L., Alkhashrami, F. A., & Nikitin, Yu. (2021). Analysis of the model of consumer behavior in the healthy products segment as a perspective for inclusive marketing development. *Marketing and Management of Innovations*, 4, 20-35. [\[Google Scholar\]](#) [\[CrossRef\]](#)
- Li, M., Li, L., & Strielkowski, W. (2019). The impact of urbanization and industrialization on energy security: A case study of China. *Energies*, 12(11), 2194. [\[Google Scholar\]](#) [\[CrossRef\]](#)
- Lipskaya-Velikovsky, L. (2021). COVID-19 isolation in healthy population in Israel: Challenges in daily life, mental health, resilience, and quality of life. *International Journal of Environmental Research and Public Health*, 18(3), 999. [\[Google Scholar\]](#) [\[CrossRef\]](#)
- Lu, J., Ren, L., Qiao, J., Yao, S., Strielkowski, W., & Streimikis, J. (2019a). Corporate social responsibility and corruption: Implications for the sustainable energy sector. *Sustainability*, 11(15), 4128. [\[Google Scholar\]](#) [\[CrossRef\]](#)
- Lu, J., Ren, L., Yao, S., Qiao, J., Strielkowski, W., & Streimikis, J. (2019b). Comparative review of corporate social responsibility of energy utilities and sustainable energy development trends in the Baltic states. *Energies*, 12(18), 3417. [\[Google Scholar\]](#) [\[CrossRef\]](#)

Novikova, O., Khandii, O., & Shamileva, L. (2021). Comparative Analysis of the Changes of Socioeconomic Risks Caused by the COVID-19 pandemic in Ukraine and the EU Countries. *European Journal of Sustainable Development*, 10(2), 147-147. [\[Google Scholar\]](#) [\[CrossRef\]](#)

Osofsky, J. D., Osofsky, H. J., & Mamon, L. Y. (2020). Psychological and social impact of COVID-19. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(5), 468. [\[Google Scholar\]](#) [\[CrossRef\]](#)

Poczeta, K., Kubuś, Ł., & Yastrebov, A. (2019). Analysis of an evolutionary algorithm for complex fuzzy cognitive map learning based on graph theory metrics and output concepts. *Biosystems*, 179, 39-47. [\[Google Scholar\]](#) [\[CrossRef\]](#)

Rosokhata, A., Saher, L., Stoyanets, N., & Butrym, O. (2020). Impact of highly qualified personnels migration on economic and innovative development. 35th IBIMA Conference: 1-2 April 2020, Seville, Spain. Retrieved from [\[Link\]](#)

Stojanov, R., Strielkowski, W., & Drbohlav, D. (2011). Labour migration and remittances: Current trends in times of economic recession. *Geografie*, 116(4), 375-400. [\[Google Scholar\]](#) [\[CrossRef\]](#)

Strielkowski, W., & Hoshle, F. (2016). Evidence for economic convergence in the EU: The analysis of past EU enlargements. *Technological and Economic Development of Economy*, 22(4), 617-630. [\[Google Scholar\]](#) [\[CrossRef\]](#)

Vasyliieva, T., Lyulyov, O., Pimonenko, T., Voitovič, S., & Bilan, Yu. (2020). Financial, socio-economic, environmental, and public health patterns of creating regional roadmaps to prevent the spread of the COVID-19 epidemic. *Financial and credit activities: Problems of Theory and Practice*, 4(35), 295-310. [\[Google Scholar\]](#) [\[CrossRef\]](#)

Wójcicki, W. (2022). Crisis aspects of the COVID-19 pandemic in the social sphere and secondarily in economic one. *Economic and Regional Studies/Studia Ekonomiczne i Regionalne*, 15(1), 74-89. [\[Google Scholar\]](#) [\[CrossRef\]](#)

World Bank open data (2023). Retrieved from [\[Link\]](#)

Zelinska, H., Andrusiv, U., Galtsova, O., & Dmytrenchenko, M. (2021). Management of social risks and their impact on the spheres of human life in the conditions of sustainable development of Ukraine. *Problemy ekorozwoju*, 16(2), 116-124. [\[Google Scholar\]](#)

Zhang, L., Chen, Y., Lyulyov, O., & Pimonenko, T. (2022). Forecasting the effect of migrants' remittances on household expenditure: COVID-19 impact. *Sustainability*, 14(7), 4361. [\[Google Scholar\]](#) [\[CrossRef\]](#)

**Наталія Летуновська**, Ph.D., Сумський державний університет, Україна

**Назар Демчишак**, д-р екон. наук, Львівський національний університет ім. І. Франка, Україна

**Марія Мінченко**, Ph.D., Сумський державний університет, Україна

**Петра Кришкова**, Ph.D., Університет економіки в Братиславі, Словаччина

**Марія Каша**, Сумський державний університет, Україна

**Анна Волк**, Сумський державний університет, Україна

**Управління соціальним брендом країни в умовах невизначеності в сфері здоров'я**

Пандемія коронавірусу XXI століття на практиці показала, що наявні на той момент механізми національних систем медичного та соціального забезпечення населення різних країн світу виявилися не спроможними швидко та ефективно адаптуватися та реалізовувати ефективні заходи щодо запобігання негативним наслідкам для досягнення стану резильєнтності та якості життя населення. У статті емпірично обґрунтовано напрямки та силу впливу пандемії COVID-19 на соціальний бренд країни з метою формування дієвих національних стратегій протидії ризикам у сфері громадського здоров'я та підтримки соціального бренду країни для її основних внутрішніх стейкхолдерів у період невизначеності. Стаття присвячена аналізу каналів, через які пандемія COVID-19 вплинула на різні аспекти національних систем управління Австрії, Словенії, Франції та України. Для аналізу використане поєднання методів кореляційного аналізу, каузального моделювання та побудови когнітивних карт для візуалізації залежностей. Виявлено, що ключовими показниками, які верифікують зазначений вплив є задоволеність потреб у медичному огляді та догляді, забезпеченість медичної системи лікарняними ліжками та загальні витрати на соціальний захист населення. Індикатором соціальної привабливості країни для її внутрішніх стейкхолдерів прийнято показник чистої міграції та емпірично визначено, що на цей показник значний вплив мають забезпеченість медичної системи та ефективність її функціонування, особливо у період аналізу даних з урахуванням стану пандемії. Виявлено залежність між соціальною та економічною забезпеченістю населення та його схильністю до критичної оцінки власного здоров'я, готовності до профілактики захворювань та формування більш високих вимог до медичного обслуговування. Визначені закономірності будуть корисними при розробленні національної стратегії побудови ефективної в умовах невизначеності системи медичного та соціального забезпечення населення, що є вагомим складовою політики її бренд-менеджменту.

**Ключові слова:** бренд країни, внутрішні стейкхолдери, міжнародний бенчмаркінг, національні ресурси управління, COVID-19.