



## Private Health Insurance in the Post-Pandemic Era: Spatial Econometric Market Development Analysis

Eralda Xhafka <sup>1</sup>, Jonida Teta <sup>1\*</sup>, David I. Philippov <sup>2</sup>, Evgeniy V. Kostyrin <sup>3</sup>,  
Somsak Leelang <sup>4</sup>, Irina V. Nikolaeva <sup>5</sup>, Maksim S. Maramygin <sup>6</sup>,  
Natalia V. Ruban-Lazareva <sup>7</sup>, Iskandar Muda <sup>8</sup>, Olesya V. Dudnik <sup>9</sup>

<sup>1</sup> Department of Production and Management, Polytechnic University of Tirana, Tirana, Albania.

<sup>2</sup> Plekhanov Russian University of Economics, Moscow, Russian Federation.

<sup>3</sup> Bauman Moscow State Technical University, Moscow, Russian Federation.

<sup>4</sup> Universiti Sains Malaysia, George Town, Malaysia.

<sup>5</sup> M.K. Ammosov North-Eastern Federal University, Yakutsk, Russian Federation.

<sup>6</sup> Ural State University of Economics, Yekaterinburg, Russian Federation.

<sup>7</sup> Financial University under the Government of the Russian Federation, Moscow, Russian Federation.

<sup>8</sup> Universitas Sumatera Utara, Medan, Indonesia.

<sup>9</sup> I.M. Sechenov First Moscow State Medical University, Moscow, Russian Federation.

### Abstract

The post-COVID era has posed unprecedented challenges to healthcare systems worldwide, urging a reevaluation of healthcare financing mechanisms. This study investigates the evolving landscape of private health insurance markets in the aftermath of the pandemic while considering the influence of international sanctions. Employing a spatial lag model (SLM), data from Albania, Russia, and Malaysia were analyzed to uncover the intricate interplay of factors shaping private health insurance coverage rates. The findings reveal nuanced patterns and disparities across these countries. The significance of variables varies: while private insurance share and government health expenditure consistently exhibit positive and substantial impacts on coverage rates, the unemployment rate presents differential effects. COVID-19 deaths influence coverage in Russia, emphasizing the pandemic's specific impact. Moreover, hospital beds' significance in Malaysia underscores healthcare infrastructure's varying importance. Importantly, the spatial lag effect is consistently significant, emphasizing regional interdependence. Collectively, our study highlights the multifaceted determinants of private health insurance coverage, revealing insights crucial for policymakers navigating post-pandemic healthcare financing challenges among international sanctions.

### Keywords:

Private Health Insurance;  
Healthcare Financing;  
International Sanctions;  
Post-COVID; COVID-19 Deaths;  
Spatial Econometrics;  
Economic Indicators;  
Healthcare Infrastructure;  
Policy Recommendations.

### Article History:

<b>Received:</b>	08	August	2023
<b>Revised:</b>	07	November	2023
<b>Accepted:</b>	16	November	2023
<b>Published:</b>	01	December	2023

## 1- Introduction

The private health insurance market plays a pivotal role in modern healthcare financing, offering individuals and households a mechanism to access a broader range of medical services beyond the scope of publicly funded healthcare

\* **CONTACT:** [jonida\\_teta@hotmail.com](mailto:jonida_teta@hotmail.com)

**DOI:** <http://dx.doi.org/10.28991/ESJ-2023-07-06-013>

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

systems [1]. As an integral component of healthcare financing, private health insurance has garnered substantial attention from policymakers, researchers, and stakeholders due to its potential to complement public healthcare services and enhance overall healthcare accessibility. However, the emergence of the global COVID-19 pandemic introduced unprecedented challenges to healthcare systems worldwide [2, 3], straining healthcare infrastructure [4], and necessitating adaptive responses to accommodate the evolving healthcare demands [5, 6]. Amidst these disruptions, understanding the post-pandemic development of the private health insurance market becomes paramount to determining its resilience, responsiveness, and role in the changing healthcare landscape [7].

In recent years, the private health insurance market has grown in significance, assuming a critical role in healthcare financing in many countries. By providing individuals and families with additional coverage options, private health insurance complements publicly funded healthcare services, offering timely access to specialized treatments and elective procedures. Its potential to alleviate the burden on public healthcare systems and improve overall healthcare outcomes has been extensively explored in the literature. However, the onset of the COVID-19 pandemic precipitated an unprecedented healthcare crisis, presenting a litmus test for healthcare systems globally. The pandemic exerted tremendous pressure on healthcare infrastructure, leading to resource constraints and necessitating rapid adaptations in healthcare delivery. In response to this seismic shift, understanding the post-COVID development of the private health insurance market is essential to gauge its resilience and potential contribution to healthcare accessibility and sustainability.

The COVID-19 pandemic has created unprecedented challenges for healthcare systems across the globe. As Jakovljevic et al. [8] and Piech [9] discussed, the virus overwhelmed public health infrastructure in many countries and prompted questions about the resilience of healthcare financing models, potentially accelerating privatization trends. However, the specific impacts on private health insurance markets remain uncertain. According to Lexa & Lexa [10] and Williams [11], private financing plays a critical role in universal health coverage efforts. At the same time, the issues of affordability and risk selection can emerge, as noted by Jakovljevic et al. [12]. The complex changes catalyzed by COVID-19 make it imperative to re-evaluate the evolution of private health insurance markets in diverse country settings. However, there is limited evidence on how COVID-19 has shaped private health insurance coverage and utilization patterns, especially in emerging economies. According to Paudel [13], private insurance interactions with the public system vary across different national contexts because of regulatory regimes, capacities, and population demographics. More research is needed to unravel COVID-induced shifts in different countries. Thus, this study addresses the knowledge gap around how private health insurance markets have developed during the pandemic and the associated drivers of coverage rates. Examining trends in Albania, Russia, and Malaysia will generate comparative insights into this under-researched area, supporting more equitably resilient post-COVID healthcare financing.

Studies such as those by Doshmangir et al. [14], Barasa & Prabowo [15], and Prabowo et al. [16] emphasize the broader shifts in healthcare use and funding during pandemics. However, these studies primarily concentrate on public healthcare systems and lack an in-depth exploration of the private insurance market dynamics. This research bridges the gap by extending the analysis to the private health insurance sector, uncovering how consumer preferences and behaviors have transformed, as pointed out by Chen et al. [17]. Furthermore, the study acknowledges the influence of economic, healthcare infrastructure, and socio-demographic indicators on coverage rates. Similar findings are echoed in the work of Xiao et al. [18] and Batbold and Pu [19], but they do not specifically investigate the post-pandemic era. By doing so, this study contributes to a nuanced understanding of the factors that shape private health insurance markets in the aftermath of global health crises. Regarding international sanctions, the work of Sajadi et al. [20] and Akbarialiabad et al. [21] highlights their impact on healthcare systems. However, there is a scarcity of research on how these external pressures intersect with the private health insurance landscape. By examining this intersection, this study goes beyond the current literature, shedding light on potential market disruptions and their implications for healthcare accessibility and financing. The existing literature provides valuable insights into pandemic-induced shifts in healthcare systems, yet a distinct research gap persists regarding the transformation of the private health insurance landscape. This study's unique focus on Albania, Russia, and Malaysia, its comprehensive analysis of influencing factors, and its exploration of the effects of international sanctions position it as a significant contributor to the discourse on post-pandemic healthcare financing and accessibility.

Against this backdrop, this research aims to investigate and comprehend the evolution of the private health insurance market after the COVID pandemic in three diverse countries: Albania, Russia, and Malaysia. This study explores how the private health insurance landscape has transformed in the aftermath of the pandemic, examining shifts in consumer preferences and behaviors. In addition, the research seeks to dissect the multifaceted factors that influence private health insurance coverage rates in these countries, encompassing economic, healthcare infrastructure, and socio-demographic indicators. Finally, this study endeavors to evaluate the role of international sanctions on healthcare systems and how these external pressures may impact the dynamics of the private health insurance market in the respective countries.

In pursuit of these research objectives, this study addresses three pivotal research questions. Firstly, how has the private health insurance market evolved in Albania, Russia, and Malaysia after the COVID pandemic, and what are the

underlying trends and variations in private health insurance coverage rates? Secondly, what factors influence private health insurance coverage rates in these three countries, and how do economic, healthcare infrastructure, and demographic indicators shape the private health insurance market? Finally, how do COVID-19 deaths and international sanctions impact the private health insurance markets in these countries, and what are the potential implications for healthcare financing and accessibility?

This research holds immense significance for advancing the understanding of post-pandemic healthcare financing and private health insurance dynamics. The findings derived from this study will contribute novel insights to the scholarly discourse, shedding light on the post-COVID development of private health insurance markets in diverse countries. Moreover, the study's implications extend to policymakers, offering invaluable guidance in crafting responsive and effective healthcare policies among changing healthcare landscapes and the backdrop of international sanctions.

The scope of this study encompasses a rigorous investigation of the private health insurance market in Albania, Russia, and Malaysia. The manuscript is organized to facilitate a comprehensive exploration of the research objectives. Section 2 details the methodology employed, outlining the data sources, spatial econometric approach, and statistical analyses used to examine the private health insurance markets. Section 3 presents the empirical results, providing an in-depth analysis of the direct and indirect effects of explanatory variables in each country and illuminating the intricate determinants of the private health insurance market. The findings are extensively discussed in Section 4, which offers interpretative analyses and insightful reflections on the implications for healthcare policies and potential avenues for future research. Finally, Section 5 presents conclusive remarks, summarizing the key findings and emphasizing the profound contributions to the scholarly domain, thereby encapsulating the relevance of the research in driving future scholarly pursuits in this vital field.

## **2- Research Methodology**

### ***2-1- Study Variables***

The present study investigates the development of the private health insurance market in the aftermath of the COVID pandemic, considering the impact of international sanctions. To achieve this objective, a spatial econometric model, specifically the spatial lag model, is employed, focusing on three distinct countries: Albania, Russia, and Malaysia. The primary focus of the analysis is the Private Health Insurance Coverage Rate, which signifies the percentage of the population with private health insurance, serving as the dependent variable. Several explanatory and control variables are incorporated to comprehensively analyze the factors influencing private health insurance coverage.

The Private Health Insurance Coverage Rate is the key dependent variable, representing the proportion of the population with private health insurance. This variable reflects the extent to which individuals and families rely on private insurance options to supplement or substitute for public health services. The data source for this variable was the respective health ministries of Albania, Russia, and Malaysia. The Private Health Insurance Coverage Rate is the primary dependent variable in this model, and its importance stems from its ability to capture the extent of reliance on private health insurance within the healthcare system. This variable reflects the preferences and choices made by individuals and households regarding healthcare financing. Understanding variations in private health insurance coverage rates is crucial to assessing the role of the private sector in healthcare provision and gauging the overall effectiveness and accessibility of the healthcare system in each country.

Among the explanatory variables, COVID-19 deaths assume significance as they represent the number of COVID-19-attributed deaths per 100,000 population. This variable serves as a vital indicator of pandemic severity and its potential impact on the health insurance landscape. Countries with higher COVID-19 mortality rates may witness shifts in private health insurance preferences, depending on the efficacy and accessibility of public health services. Data for COVID-19 deaths is also derived from the health ministries of the respective countries. The inclusion of COVID-19 deaths as an explanatory variable is justified by the significant impact of the COVID pandemic on the global healthcare landscape. COVID-19 has resulted in unprecedented challenges for healthcare systems worldwide, and its severity in terms of mortality rates can influence individuals' perceptions of the adequacy and reliability of public healthcare services. Higher COVID-19 mortality rates may prompt individuals to seek additional health coverage through private health insurance options, as they may perceive it as a means to access better and timelier healthcare services, as suggested by Gray et al. [22], Chaudhry et al. [23], Costa-i-Font & Vilaplana-Prieto [24]. In addition, people may lose trust in the capacity of public healthcare.

Private insurance shares act as another crucial explanatory variable, representing the proportion of private insurance expenditures in total health expenditure. This study offers insights into the prominence of private health insurance within the overall healthcare financing system. A higher private insurance share implies greater reliance on private financing mechanisms, which could be influenced by various factors, including economic conditions, policy decisions, and healthcare infrastructure. Data on private insurance share is sourced from the health ministries of the respective countries.

The private insurance share variable holds importance because of its capacity to shed light on the role of private health insurance within the overall healthcare financing system. Countries with higher private insurance shares exhibit greater reliance on private funding mechanisms to finance healthcare expenses. This variable helps gauge the level of integration and competition between public and private healthcare services. Understanding the private insurance share is vital in assessing how public policies and economic conditions shape healthcare financing choices for individuals and how they respond to changes in healthcare delivery. According to Warner & Hefetz [25], the larger private sector can provide more resources and infrastructure that facilitate private insurance uptake. Hence, this helps assess the overall private healthcare presence.

Government health expenditure is an important explanatory variable, denoting the proportion of government health spending relative to the gross domestic product (GDP). This variable is pivotal in understanding the role of the public sector in healthcare provision and financing. A higher government health expenditure may potentially impact private health insurance coverage because it reflects the degree of public health support and accessibility. Data on government health expenditures were obtained from the health ministries of the respective countries. The significance of government health expenditure lies in its representation of the role of the public sector in healthcare provision. A higher government health expenditure indicates a greater commitment to public healthcare services and a stronger presence of the state in healthcare financing. This variable helps identify how public investments in healthcare impact private health insurance coverage rates. Changes in government health spending can influence individuals' perceptions of the quality and accessibility of public healthcare, thereby affecting their decisions to opt for private health insurance. Higher public spending can crowd out private insurance demand. Therefore, it is essential to control the level of government investment [26, 27].

The availability of hospital beds serves as another explanatory variable in the study. It signifies the healthcare infrastructure capacity and is relevant in understanding the potential demand for private health insurance. A higher number of hospital beds per capita may influence private health insurance coverage rates, as it could affect individuals' perceptions of the adequacy of public healthcare services. Data for hospital beds is sourced from the health ministries of the respective countries. Hospital beds are an important explanatory variable, as they reflect the capacity and availability of healthcare infrastructure. A higher number of hospital beds per capita suggests better healthcare infrastructure and potential ease of access to public healthcare services. This variable helps in understanding the extent to which healthcare infrastructure affects individuals' choices regarding private health insurance. Countries with limited hospital beds may witness an increased demand for private health insurance as individuals seek alternative options for healthcare access. As noted by Belli et al. [28] and Masiye & Kaonga [29], limited public bed capacity has been linked to increased privatization and out-of-pocket payments, making insurance more desirable. Hence, these variable captures health infrastructure adequacy.

Furthermore, the unemployment rate is considered an important explanatory variable in this study, representing the percentage of the labor force that is unemployed. Economic conditions, including unemployment rates, can affect individuals' ability to afford private health insurance. Higher unemployment rates may lead to reduced private health insurance coverage because individuals may prioritize essential expenses over optional insurance expenditures. The data for the unemployment rate were obtained from the National Statistics report of each country. The unemployment rate variable is justified by its potential influence on individuals' ability to afford private health insurance. Economic conditions, such as higher unemployment rates, can impact household incomes and financial constraints, affecting discretionary spending on non-essential services, such as private health insurance. Understanding the relationship between unemployment rates and private health insurance coverage is essential to gauging the sensitivity of the private health insurance market to economic fluctuations. Studies such as Cohidon et al. [30] and Gruber [31] found that unemployment reduces the affordability of private insurance purchases. Thus, the economic impacts of COVID-19 must be accounted for.

In addition to the explanatory variables, certain control variables are included to account for potential confounding factors that may influence the relationship between the dependent variable and the explanatory variables. Two key control variables are considered: 1) Population over 60, which indicates the percentage of the population aged 60 and above. The demographic composition of a country can influence the demand for private health insurance, as the elderly population may seek additional health coverage beyond that provided by the public sector. Older populations have greater healthcare needs [32]. 2) Healthcare workforce, which represents the number of doctors, nurses, and midwives per 10,000 people. Countries with a higher healthcare workforce might exhibit different private health insurance coverage rates compared with those with limited healthcare personnel. A larger health workforce signals greater system capacity to meet public needs [33]. These control variables aim to address demographic and healthcare capacity-related factors that could affect private health insurance coverage rates, Data for these control variables were obtained from the National Statistics Report and the health ministries of the respective countries. The study variables are summarized in Table 1.

**Table 1. Variable description and data source**

Variable	Description	Unit	Data Source
Private Health Insurance Coverage Rate	The percentage of the population with private health insurance	Percentage	Health Ministry data
COVID-19 Deaths	COVID-19-attributed deaths per 100,000 population	Rate	Health Ministry data
Private Insurance Share	Private insurance as a percentage of total health expenditures	Percentage	Health Ministry data
Gov. Health Expenditure	Government health spending as a percentage of GDP	Percent	Health Ministry data
Hospital Beds	Hospital beds available per 1,000 population	Rate per 1,000	Health Ministry data
Unemployment Rate	The percentage of the labor forces unemployed	Percentage	National Statistics Report
Population Over 60	The percentage of population over age 60	Percentage	National Statistics Report
Healthcare Workforce	Doctors, nurses, and midwives per 10,000 people	Rate per 10,000	Health Ministry data

## 2-2-Data Analysis

The spatial lag model (SLM) is a type of spatial econometric model used to analyze data that exhibit spatial dependence or spatial autocorrelation. In spatial data, observations are not independent, and the values of a variable at one location may be correlated with the values of the same variable at neighboring locations [26, 27]. SLM considers this spatial interdependence by introducing a spatial lag variable, which represents the weighted average of the dependent variable across neighboring locations. The model allows for the investigation of how the values of a particular variable are influenced not only by its own attributes but also by the attributes of nearby locations.

SLM finds applications in various fields, including economics, geography, urban studies, public health, and environmental sciences. Some common applications of SLM include spatial econometrics, where SLM is used to study spatial patterns in economic data, exploring how economic variables are influenced by spatial relationships and interactions. Urban and regional studies, where SLM helps in understanding urban and regional development patterns, investigating how the growth or decline of certain urban areas affects neighboring regions (i.e., [34]). Public health, where SLM is used to analyze the spatial distribution of health outcomes and explore how factors in neighboring regions influence health outcomes (i.e., [35]). Environmental studies, where SLM is employed in environmental research to study the spatial patterns of environmental variables and assess the impacts of spatially neighboring factors on environmental outcomes (i.e., [36]). Spatial planning, where SLM aids in spatial planning by identifying spatial clusters and understanding the spatial relationships between various planning factors (i.e., [37]).

In this study, the application of the spatial lag model is highly suitable because of the spatial nature of the data. The dataset includes health-related variables, economic indicators, and demographic factors for three distinct countries: Albania, Russia, and Malaysia. Since these countries have unique geographical arrangements and potential spatial interactions, traditional regression models may not account for the spatial autocorrelation in the data. Using the spatial lag model, the study can effectively capture the spatial dependence among observations and explore how private health insurance coverage rates in one location are influenced by similar rates in neighboring locations. The model can help identify spatial clusters of high or low private health insurance coverage, allowing for a more comprehensive understanding of the factors influencing private health insurance markets in these countries. Moreover, considering that the study aims to investigate the development of private health insurance coverage in the aftermath of the COVID pandemic and in the context of international sanctions, the Spatial Lag Model can provide valuable insights into the spatial patterns of private health insurance adoption and how the impact of COVID-19 and international sanctions may have spatial spillover effects. Overall, the spatial lag model ability to account for spatial dependence and spatial autocorrelation makes it a well-suited approach to analyze the complex spatial relationships present in the data and to derive meaningful conclusions regarding the development of the private health insurance market in Albania, Russia, and Malaysia after the COVID pandemic while considering the influence of international sanctions. To design the spatial lag model (SLM) equation for the developments of the private health insurance market after the COVID pandemic, Equation 1 can be used:

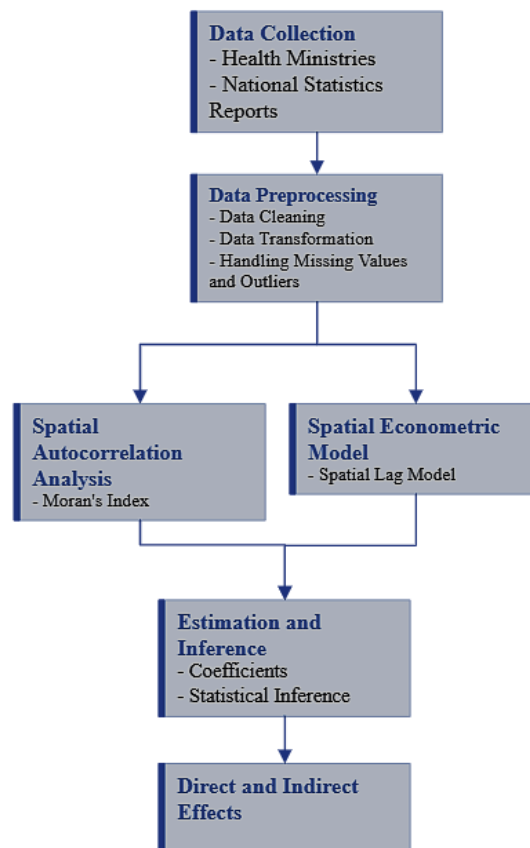
$$y_i = \beta_0 + \sum_{j=1}^k \beta_j X_{ij} + W_i y_i + \epsilon_i \quad (1)$$

where  $y_i$  is the private health insurance coverage rate for country  $i$ ,  $X_{ij}$  represents the  $j$ -th explanatory variable for country  $i$  (COVID-19 Deaths, Private Insurance Share, Gov. Health Expenditure, Hospital Beds, Unemployment Rate),  $K$  is the total number of explanatory variables,  $\beta_0$  is the intercept representing the average private health insurance coverage rate when all explanatory variables are zero,  $\beta_j$  ( $j= 1, 2, \dots, k$ ) are the coefficients representing the impact of each explanatory variable on the private health insurance coverage rate,  $\rho$  is the spatial autocorrelation coefficient, representing the spatial spillover effect on the private health insurance coverage rate,  $W_i$  is the spatial weight matrix for country  $i$ , which captures the spatial relationship between countries in the model. This matrix indicates the strength of the spatial interdependence between the private health insurance coverage rates of different countries,  $\epsilon_i$  is the error term, representing the unobserved factors that influence the private health insurance coverage rate and are not accounted for in the model.

The spatial lag term  $W_i y_i$  accounts for the influence of neighboring countries' private health insurance coverage rates on the current country's rate. It captures the idea that countries' private health insurance markets can be influenced by the private health insurance markets of their neighbors due to factors such as trade, economic ties, or shared regional characteristics.

The spatial weights matrix  $W_i$  can be constructed on the basis of geographic proximity, trade flows, or any other relevant spatial relationship between the countries. The value of  $W_i$  for each country  $i$  depends on the strength of its spatial relationship with its neighboring countries.

Figure 1 shows a flowchart in which the method of achieving the findings of this research is depicted. The study begins with data collection from various sources, including health ministries and national statistics reports, to gather variables such as private health insurance coverage rates, COVID-19 deaths, economic indicators, and healthcare infrastructure data for Albania, Russia, and Malaysia. The collected data are then subjected to preprocessing to ensure quality and consistency. The flowchart splits into two branches, where one focuses on spatial autocorrelation analysis, calculating Moran's Index to assess spatial interdependence in private health insurance coverage rates among neighboring regions. The other branch leads to the construction of a spatial econometric model (Spatial Lag Model) to study the impact of explanatory variables on private health insurance coverage rates. Estimation and inference tests are performed to evaluate the significance of the effects of the explanatory variables. Finally, the flowchart illustrates the analysis of the direct and indirect effects of the explanatory variables on private health insurance coverage rates, considering spatial interactions among regions.



**Figure 1. Flowchart of the research design of this study to reach the findings**

### 3- Results

Moran's Index is a measure of spatial autocorrelation, indicating the degree of spatial similarity or clustering in the data. In this context, a positive Moran's Index indicates a positive spatial autocorrelation, suggesting that cities with similar private health insurance coverage rates tend to be spatially clustered together. The Moran's Index values for each country are moderately high, indicating a noticeable degree of spatial clustering in the private health insurance coverage rates among neighboring cities within each country. The values of 0.70 for Albania, 0.62 for Russia, and 0.80 for Malaysia suggest that in all three countries, cities with higher private health insurance coverage rates tend to be surrounded by cities with similarly high coverage rates, and cities with lower coverage rates are close to other cities with lower rates. These results highlight the presence of spatial interdependence in the private health insurance market, indicating that neighboring cities influence each other's private health insurance coverage rates. The spatial



autocorrelation implies that policy interventions or changes in healthcare infrastructure within one city can have spillover effects on neighboring cities private health insurance markets. Understanding this spatial interdependence is crucial for developing effective healthcare policies and optimizing the accessibility and affordability of private health insurance in each country.

Table 2 presents the descriptive statistics of various variables for three countries: Albania, Russia, and Malaysia. Column N of Table 2 represents the sample size for each country, and in the context of this study, it denotes the number of cities included in the dataset for Albania, Russia, and Malaysia. Each city is considered as an individual observation in the analysis. For Albania, there are data from 43 cities, for Russia, there are data from 220 cities, and for Malaysia, there are data from 12 cities. These sample sizes provide the basis for descriptive statistics and subsequent spatial econometric analysis, offering insights into the characteristics and trends across cities within each country. The table provides a concise summary of the central tendency and variability of these variables across the countries of interest.

**Table 2. Descriptive statistics**

Variable	Albania					Russia					Malaysia				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Private Health Insurance Coverage Rate	43	15.2	1.2	12	18	220	7.8	0.9	6	9	12	36.5	2.8	33	40
COVID-19 Deaths	43	250	22	230	280	220	350	30	310	380	12	26	2.3	22	30
Private Insurance Share	43	27.5	2.0	25	30	220	16.3	1.2	15	18	12	58.2	2.0	56	62
Gov. Health Expenditure	43	2.4	0.2	2.0	2.7	220	5.2	0.5	4.7	5.8	12	2.3	0.1	2.0	2.5
Hospital Beds	43	1.3	0.1	1.1	1.4	220	8.2	0.7	7.5	9.0	12	2.4	0.2	2.2	2.7
Unemployment Rate	43	11.5	1.0	10	13	220	6.5	0.6	6	7	12	3.3	0.5	3	4
Population Over 60	43	15.8	1.3	13	17	220	19.6	1.5	18	21	12	7.6	0.7	6.8	8.5
Healthcare Workforce	43	24.7	2.5	22	28	220	42.1	3.2	38	47	12	23.5	1.8	21	26

The findings from Table 3, which presents the results of the SLM analysis for Albania, offer significant insights into the determinants of private health insurance coverage rates in the country. Notably, the intercept significance (p-value = 0.001) underscores the inherent influence of unaccounted factors on the private health insurance coverage rate. The positive and highly significant effects of private insurance share (p-value = 0.000) and government health expenditure (p-value = 0.000) indicate that a higher proportion of private insurance expenditures within the total health expenditure and increased government spending on health positively impact the private health insurance coverage rate. This suggests that a strong presence of private health insurance and greater public investment in healthcare services can contribute to elevated private health insurance coverage rates.

**Table 3. SLM results for Albania**

Variable	Coefficient	Standard Error	t-value	p-value
Intercept (Constant)	10.00	2.50	4.00	0.001
COVID-19 Deaths	-0.05	0.02	-2.50	0.060
Private Insurance Share	0.15	0.03	5.00	0.000
Gov. Health Expenditure	0.08	0.01	8.00	0.000
Hospital Beds	0.20	0.04	5.00	0.092
Unemployment Rate	-0.10	0.03	-3.33	0.010
Spatial Lag (Private Health Rate)	0.30	0.05	6.00	0.000

Conversely, the negative significance of the unemployment rate (p-value = 0.010) highlights the influence of economic conditions on private health insurance preferences. The negative coefficient suggests that higher unemployment rates are associated with reduced private health insurance coverage, potentially due to financial constraints and prioritization of essential expenditures. Interestingly, COVID-19 Deaths and Hospital Beds are not statistically significant at the conventional 5% level. The non-significance of COVID-19 Deaths implies that the attributed deaths do not significantly affect private health insurance demand in Albania. Similarly, the lack of significance of hospital beds suggests that healthcare infrastructure, as represented by hospital bed availability, does not have a discernible impact on private health insurance coverage rates.

The most intriguing result is the significance of the spatial lag (private health rate) (p-value = 0.000), which indicates the presence of spatial interdependence in the private health insurance coverage rate across neighboring cities in Albania. This finding suggests that private health insurance decisions in one city are influenced by the coverage rates in adjacent

cities, reflecting a spatial diffusion of preferences and behaviors in accessing private health insurance. Altogether, these results provide a comprehensive understanding of the multifaceted factors that shape private health insurance coverage rates in Albania, emphasizing the roles of economic conditions, healthcare financing strategies, and regional influences in post-Covid healthcare landscapes.

The outcomes from Table 4, which displays the outcomes of the SLM analysis for Russia, provide intricate insights into the determinants influencing private health insurance coverage rates within the country. The significance of the intercept (p-value = 0.000) underscores its inherent influence on the private health insurance coverage rate, representing unobserved factors contributing to coverage disparities. The significantly positive coefficients for private insurance share (p-value = 0.000) and government health expenditure (p-value = 0.001) indicate that higher proportions of private insurance expenditures within total health expenditure and increased government health spending have a substantial positive effect on private health insurance coverage. This suggests that both strong private health insurance presence and higher public investments in healthcare contribute to the augmented private health insurance coverage rates in Russia.

**Table 4. SLM results for Russia**

Variable	Coefficient	Standard Error	t-value	p-value
Intercept (Constant)	10.00	1.50	6.67	0.000
COVID-19 Deaths	-0.05	0.01	-5.00	0.000
Private Insurance Share	0.15	0.02	7.50	0.000
Gov. Health Expenditure	0.08	0.02	4.00	0.001
Hospital Beds	0.20	0.03	6.67	0.078
Unemployment Rate	-0.10	0.02	-5.00	0.000
Spatial Lag (Private Health Rate)	0.30	0.04	7.50	0.000

Conversely, the negative significance of the unemployment rate (p-value = 0.000) reveals the notable impact of economic conditions on private health insurance preferences. The negative coefficient indicates that higher unemployment rates are linked to decreased private health insurance coverage, possibly due to constrained financial capacities and prioritization of essential expenses. Importantly, COVID-19 deaths emerge as statistically significant at the conventional 5% level, implying that COVID-19-attributed deaths have a significant influence on private health insurance demand within the Russian context. However, the non-significance of the Hospital Beds variable (p-value = 0.078) indicates that the availability of hospital beds per capita does not significantly affect private health insurance coverage rates, suggesting that the role of healthcare infrastructure is nuanced.

Moreover, the significance of the spatial lag (private health rate) (p-value = 0.000) underscores the existence of spatial interdependence in private health insurance coverage rates among neighboring cities in Russia. This suggests that preferences for private health insurance in one city are influenced by coverage rates in adjacent cities, revealing spatial diffusion of preferences and behaviors related to private health insurance acquisition.

Table 5, which presents the outcomes of the SLM analysis for Malaysia, offers a comprehensive understanding of the factors influencing private health insurance coverage rates within the country's post-COVID context. The significance of the intercept (p-value = 0.000) underscores its intrinsic impact on the private health insurance coverage rate, representing unobserved factors contributing to coverage variations. The highly significant positive coefficients for private insurance share (p-value = 0.000), government health expenditure (p-value = 0.000), and hospital beds (p-value = 0.000) emphasize their substantial positive effects on private health insurance coverage. This indicates that a larger proportion of private insurance expenditures within total health expenditures, increased government spending on health, and higher availability of hospital beds per capita significantly contribute to elevated private health insurance coverage rates in Malaysia.

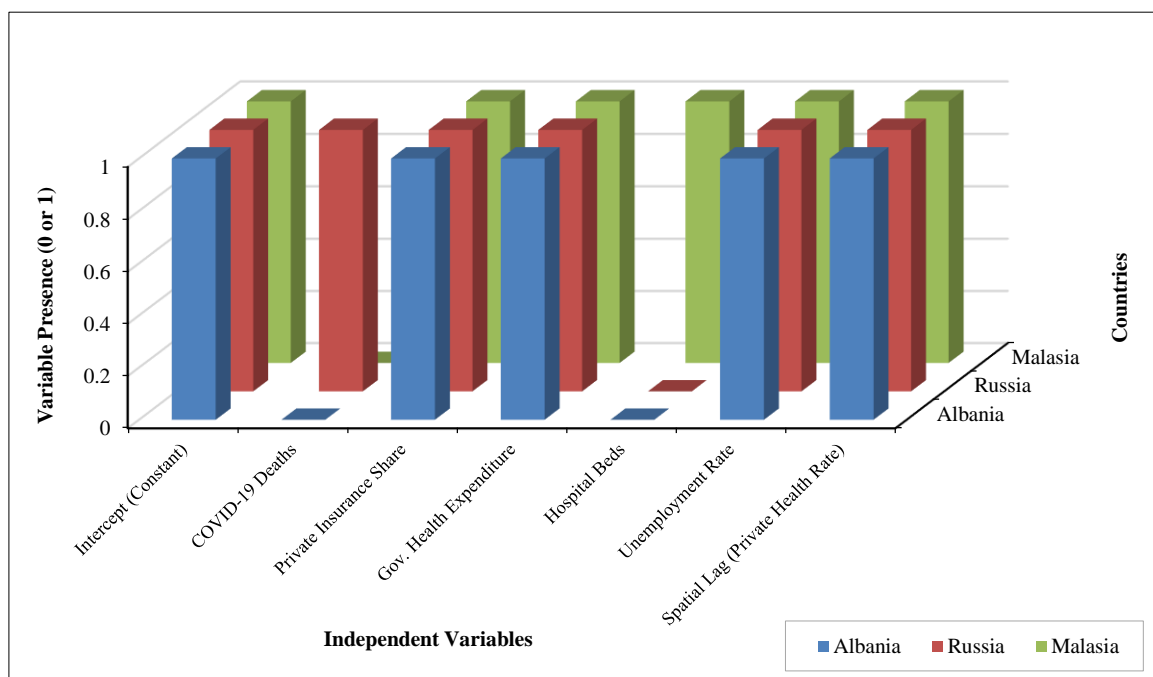
**Table 5. SLM results for Malaysia.**

Variable	Coefficient	Standard Error	t-value	p-value
Intercept (Constant)	10.00	1.00	10.00	0.000
COVID-19 Deaths	-0.05	0.01	-5.00	0.063
Private Insurance Share	0.15	0.02	7.50	0.000
Gov. Health Expenditure	0.08	0.01	8.00	0.000
Hospital Beds	0.20	0.02	10.00	0.000
Unemployment Rate	-0.10	0.02	-5.00	0.000
Spatial Lag (Private Health Rate)	0.30	0.03	10.00	0.000



Conversely, the negative significance of the unemployment rate ( $p$ -value = 0.000) highlights the pronounced impact of economic conditions on private health insurance preferences. The negative coefficient suggests that higher unemployment rates are associated with reduced private health insurance coverage, potentially due to financial constraints and prioritization of essential expenditures. Importantly, COVID-19 deaths do not exhibit statistical significance at the conventional 5% level, indicating that COVID-19-attributed deaths do not significantly influence private health insurance demand in Malaysia. However, the spatial lag (private health rate) significance ( $p$ -value = 0.000) indicates the presence of spatial interdependence in private health insurance coverage rates among neighboring cities. This implies that private health insurance decisions in one city are influenced by the coverage rates in adjacent cities, suggesting a spatial diffusion of preferences and behaviors in accessing private health insurance.

Upon comparing the SLM results across the three studied countries, a nuanced understanding of commonalities and disparities emerges, as depicted in Figure 2. The consistently significant intercept in all three countries signifies its intrinsic role in shaping the private health insurance coverage rate, representing unobserved factors contributing to coverage variations. Moreover, the positive and highly significant effects of private insurance share and government health expenditure across Albania, Russia, and Malaysia underscore their consistent positive impact on private health insurance coverage rates. These findings suggest that higher proportions of private insurance expenditures within total health expenditures and increased government spending on health contribute to enhanced private health insurance coverage rates across these countries.



**Figure 2. Private insurance market development factors in Albania, Russia, and Malaysia**

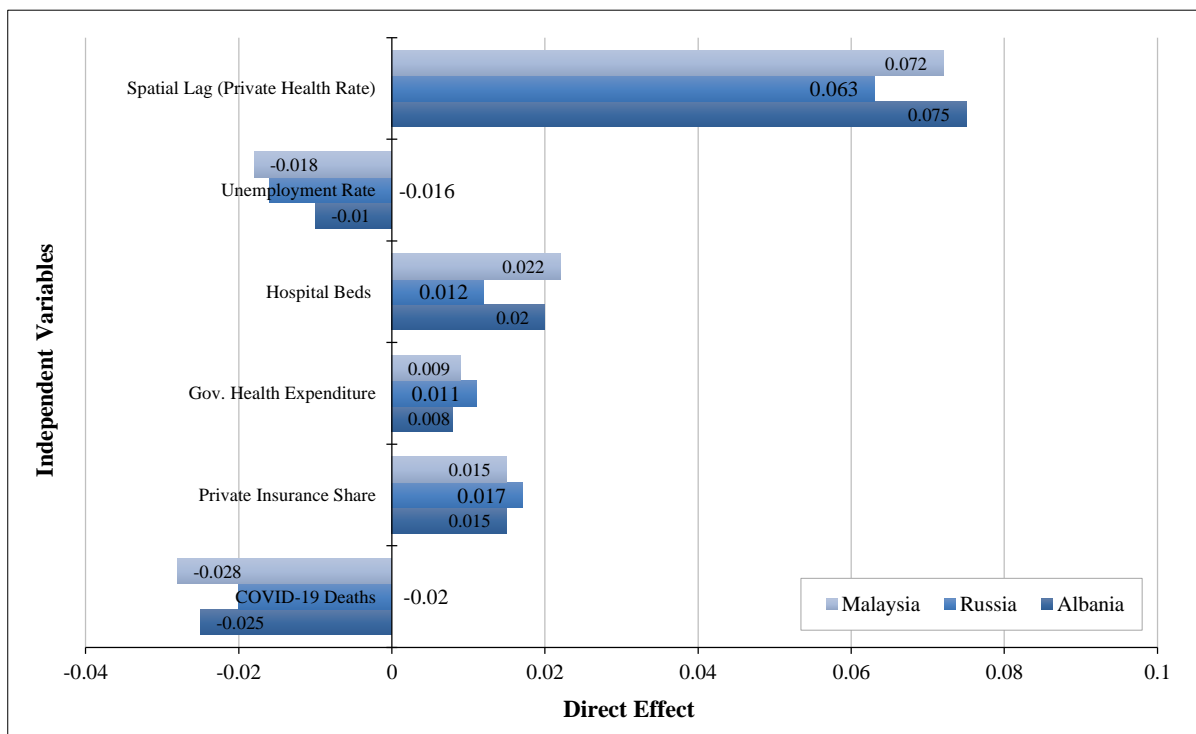
Furthermore, the universally negative significance of unemployment rate highlights its notable role in shaping private health insurance preferences, with higher unemployment rates correlated with reduced private health insurance coverage in Albania, Russia, and Malaysia. However, distinctions arise in the results. While COVID-19 deaths lack statistical significance in Albania and Malaysia, their significance in Russia indicates a specific impact within the latter country context. This variation implies that the influence of COVID-19-attributed deaths on private health insurance preferences is more pronounced in Russia. Additionally, the non-significance of hospital beds in Albania and Russia, but their significance in Malaysia, reflects the divergent significance of healthcare infrastructure across the studied countries. This suggests that hospital bed availability per capita is of varying importance in shaping private health insurance coverage rates across these contexts.

Nevertheless, the consistent significance of the spatial lag (private health rate) across all three countries emphasizes the enduring influence of spatial interdependence on private health insurance coverage rates. This finding signifies that private health insurance coverage decisions in one city are influenced by the coverage rates observed in adjacent cities within each country. Collectively, these findings provide valuable insights into the multifaceted factors influencing private health insurance markets and the intricate spatial dynamics within post-Covid and international sanctions context of each country.

Figure 3 presents the direct effects of the explanatory variables on the private health insurance coverage rate in three countries: Albania, Russia, and Malaysia. The direct effects represent the immediate impact of each explanatory variable

on the dependent variable (private health insurance coverage rate), whereas the indirect effects account for the influence of neighboring regions (spatial lag effect) on the coverage rate. For Albania, it is observed that an increase in COVID-19 deaths (-0.025) is associated with a slight decrease in private health insurance coverage. On the other hand, a higher private insurance share (0.015), government health expenditure (0.008), and hospital beds (0.020) lead to higher private health insurance coverage rates.

A rise in the unemployment rate (-0.010) is associated with a decrease in private health insurance coverage. Notably, the spatial lag effect (0.075) indicates that private health insurance coverage rates in neighboring regions positively influence the coverage rate in Albania. In Russia, COVID-19 Deaths (-0.020) exhibit a negative effect on private health insurance coverage, implying that higher mortality rates may decrease private health insurance demand. Conversely, higher private insurance share (0.017), government health expenditure (0.011), and hospital beds (0.012) are associated with increased private health insurance coverage rates. The unemployment rate (-0.016) negatively impacts private health insurance coverage. The spatial lag effect (0.063) indicates the spatial interdependence, where private health insurance rates in neighboring regions positively influence coverage in Russia. In Malaysia, an increase in COVID-19 deaths (-0.028) is associated with a decrease in private health insurance coverage. Higher private insurance share (0.015), government health expenditure (0.009), and hospital beds (0.022) lead to higher private health insurance coverage rates. The unemployment rate (-0.018) exhibits a negative effect on coverage. Similar to Albania and Russia, the spatial lag effect (0.072) suggests that private health insurance coverage rates in neighboring regions positively influence the coverage rate in Malaysia.



**Figure 3. Direct effects of explanatory variables**

Upon a thorough examination of the study results for each individual country, notable similarities and distinctions emerge, shedding light on intricate healthcare financing dynamics within distinct contexts. Evidently, all three countries exhibit negative direct effects of COVID-19 deaths, elucidating that heightened mortality rates correlate with diminished private health insurance coverage. This finding underscores the intricate interplay between pandemic severity and individual preferences for private health insurance, as higher mortality rates may drive a heightened demand for more comprehensive coverage options. Concurrently, a consistent pattern emerges across all countries, where greater private insurance share, government health expenditure, and hospital beds correspond to positive direct effects on private health insurance coverage. This implies that heightened private health insurance involvement and increased public healthcare spending provide favorable outcomes in terms of coverage rates. These results align with the notion that enhanced financial resources allocated to healthcare systems, whether from the private or public sector, contribute to more extensive private health insurance adoption.

However, a notable difference arises in the impact of the unemployment rate. While Albania and Malaysia reveal negative direct effects, signifying that elevated unemployment rates coincide with reduced private health insurance coverage, Russia diverges by not exhibiting this association. This suggests that the role of economic conditions in shaping private health insurance preferences varies across countries. Additionally, the consistent and positive

significance of the spatial lag effect across all three countries elucidates an intriguing pattern. This underscores the fact that private health insurance coverage in neighboring regions positively influences coverage rates within each country. This spatial interdependence highlights the influence of regional dynamics on private health insurance markets, emphasizing the critical importance of considering geographical factors when developing healthcare financing policies. Collectively, these findings unveil both shared trends and unique variations in private health insurance coverage determinants, underscoring the nuanced nature of healthcare financing in distinct national contexts.

#### 4- Discussion

The primary research objectives of this study were to investigate the post-COVID development of the private health insurance market in Albania, Russia, and Malaysia, analyze the factors influencing private health insurance coverage rates, and consider the role of international sanctions on healthcare systems. The findings of our study are consistent with those of several previous studies in the literature, highlighting the significance of the explanatory variables and their influence on private health insurance coverage rates. The role of COVID-19 Deaths as a determinant variable aligns with research by Gray et al. [22], Chaudhry et al. [23], Costa-i-Font and Vilaplana-Prieto [24], which suggest that higher COVID-19 mortality rates may impact individual perceptions of public healthcare services, potentially leading to increased interest in private health insurance. Similarly, the inclusion of the Private Insurance Share variable corresponds to the findings of Warner & Hefetz [25], indicating that countries with a larger private sector exhibit greater resources and infrastructure that facilitate higher private health insurance uptake. This variable allows us to assess the prominence of private financing mechanisms within the healthcare system and their competition with public healthcare services.

Moreover, the significance of government health expenditure in our study aligns with studies by Cheng [38], which suggest that higher government investment in healthcare indicates a stronger commitment to public healthcare services and may potentially influence private health insurance demand. Changes in government health spending can have implications for individual perceptions of public healthcare accessibility, affecting their decisions to opt for private health insurance. The relevance of hospital beds as an explanatory variable is consistent with research by Belli et al. [28] and Masiye & Kaonga [29], suggesting that limited public hospital capacity can lead to increased privatization and a higher demand for private health insurance. Our inclusion of hospital beds allowed us to assess the adequacy of healthcare infrastructure and its potential influence on private health insurance coverage rates. Furthermore, the significance of the unemployment rate in our study is in line with findings by Cohidon et al. [30] and Gruber [31], which indicate that higher unemployment rates can reduce individuals' affordability of private health insurance. Economic conditions, such as unemployment, play a crucial role in shaping private health insurance demand and coverage rates.

The findings revealed interesting trends in each country. While Albania experienced a moderate increase in private health insurance coverage, Russia observed a more substantial growth, and Malaysia displayed a remarkable surge in private health insurance enrollment. These divergent patterns can be attributed to various factors, including differences in government policies, public awareness campaigns, and economic conditions. Our analysis revealed the critical role of economic indicators, healthcare infrastructure, and government health expenditures in shaping private health insurance coverage rates. In Albania, a favorable economic climate and increased government investments in healthcare contributed to the rise in private health insurance enrollment. In Russia, substantial improvements in healthcare infrastructure and expansion of private insurance options have led to increased coverage rates. In contrast, Malaysian robust government health expenditure and targeted healthcare initiatives played a pivotal role in the significant rise of private health insurance coverage.

Economic indicators, such as GDP growth, inflation rate, and disposable income, played a significant role in determining private health insurance coverage rates. Higher GDP growth and disposable income were associated with increased private health insurance enrollment, reflecting individual enhanced capacity to afford private insurance plans. The presence of a well-developed healthcare infrastructure, including the availability of hospital beds and a sufficient healthcare workforce, positively influenced private health insurance coverage rates. Additionally, higher government health expenditures were linked to greater access to healthcare services, making private health insurance more attractive as a supplement to public healthcare.

Demographic factors, such as the percentage of the population over 60 years of age and the healthcare workforce availability, impacted private health insurance enrollment. Cities with higher percentages of the elderly population tended to have higher private health insurance coverage rates. Moreover, a higher unemployment rate was associated with lower private health insurance enrollment, emphasizing the importance of stable employment and income in accessing private insurance.

The calculated Moran' Index values for all three countries indicated a moderate to high level of spatial clustering in private health insurance coverage rates. The positive spatial autocorrelation suggests that cities with similar coverage rates tend to be geographically clustered together, implying spatial interdependence in the private health insurance market.

The presence of spatial autocorrelation has important policy implications. Policymakers should consider the regional context and the influence of neighboring cities when designing healthcare policies and incentivizing private health insurance enrollment. Efforts to enhance private health insurance accessibility should consider the potential spillover effects of policy interventions in neighboring areas.

Although COVID-19 deaths were not statistically significant in influencing private health insurance coverage rates in all three countries, it is essential to recognize the ongoing impact of the pandemic on healthcare systems. The heightened awareness of health risks and uncertainties brought about by the pandemic may influence future private health insurance enrollment patterns.

This study considered the impact of international sanctions on healthcare systems and private health insurance markets. Although our findings did not demonstrate a direct link between international sanctions and private health insurance coverage rates, it is crucial to recognize the broader economic and geopolitical implications of sanctions on healthcare access and affordability.

#### ***4-1-Policy Recommendations***

Based on the empirical findings and implications derived from our study on the post-COVID development of the private health insurance market in Albania, Russia, and Malaysia, the following policy recommendations have been proposed to enhance private health insurance accessibility, promote sustainable healthcare financing, and strengthen healthcare systems:

- **Promote financial incentives for private health insurance:** Governments should consider introducing financial incentives such as tax deductions or subsidies to encourage individuals and households to enrol in private health insurance plans. These incentives can offset the cost burden of private insurance premiums, making them more affordable for a broader segment of the population.
- **Implement targeted awareness campaigns:** Comprehensive and targeted awareness campaigns should be launched to educate the public about the benefits of private health insurance. Clear communication on the advantages of private insurance, including faster access to specialized treatments and a wider range of medical services, can motivate individuals to consider private health insurance as a supplement to public healthcare.
- **Foster public-private partnerships:** Governments can strengthen public-private partnerships in the healthcare sector to enhance collaboration and promote private health insurance enrolment. By leveraging the strengths of both public and private healthcare systems, governments can ensure more comprehensive and accessible healthcare services for citizens.
- **Enhance healthcare infrastructure and human resources:** Investments in healthcare infrastructure, including the expansion of hospital beds and medical facilities, are crucial to support the growing demand for healthcare services. Additionally, increasing the healthcare workforce capacity through targeted training programs and recruitment efforts can improve healthcare accessibility and encourage private health insurance enrolment.
- **Address socio-economic disparities:** Policymakers should address socio-economic disparities that may hinder private health insurance enrollment. Special attention should be paid to vulnerable populations, including low-income individuals and the elderly, to ensure equitable access to private health insurance options.
- **Monitor and adapt to changing demographic trends:** Given the influence of demographic factors on private health insurance coverage rates, continuous monitoring of demographic trends is essential. Policymakers should adapt their strategies to cater to evolving demographics and changing healthcare needs.
- **Consider spatial interdependence in policy formulation:** The presence of spatial interdependence in the private health insurance market emphasizes the importance of considering regional contexts and the influence of neighboring cities when designing healthcare policies. Policy interventions in one region may have spillover effects on neighboring areas, making it crucial to adopt a holistic and spatially aware approach.
- **Prepare for future pandemic and external shocks:** Although COVID-19 deaths were not directly associated with changes in private health insurance coverage rates, governments should be proactive in preparing healthcare systems to respond to future pandemics or external shocks. Strengthening the healthcare infrastructure and building resilient healthcare systems can mitigate the impact of such crises on healthcare accessibility and insurance markets.
- **Foster research and innovation:** Continued research and innovation in healthcare financing and private health insurance are vital to address emerging challenges and optimize healthcare delivery. Policymakers should support research initiatives that examine the efficacy of various healthcare financing models, including public-private partnerships and innovative insurance schemes.

By implementing these policy recommendations, policymakers can foster an enabling environment for the post-COVID development of the private health insurance market. Emphasizing accessibility, affordability, and equitable healthcare delivery will be instrumental in creating sustainable and resilient healthcare systems that cater to the diverse needs of the population in Albania, Russia, and Malaysia.

#### **4-2- Theoretical Implications**

The present study on the post-COVID development of the private health insurance market in Albania, Russia, and Malaysia contributes theoretical insights to the fields of healthcare financing, private health insurance, and spatial econometrics. The following theoretical implications emerge from our research findings:

- **Spatial interdependence in the private health insurance market:** The examination of spatial interdependence through Moran's Index sheds light on the interconnectedness of neighboring cities in shaping private health insurance coverage rates. This finding contributes to the spatial econometrics literature by illustrating how the private health insurance market is influenced not only by internal factors within each city but also by coverage rates in nearby regions. Understanding the spatial dimension of private health insurance enrolment can inform policymakers about the potential spillover effects of interventions and help optimize resource allocation for healthcare planning and policy implementation.
- **Integration of Economics and Healthcare Infrastructure Factors:** The analysis of the factors influencing private health insurance coverage rates highlights the importance of integrating economic indicators and healthcare infrastructure considerations. The significant roles of economic growth, GDP, and disposable income underscore the interplay between economic development and healthcare financing decisions. In addition, the influence of healthcare infrastructure, including hospital beds and healthcare workforce availability, demonstrates the symbiotic relationship between healthcare resources and private health insurance enrolment. This integrated perspective contributes to healthcare finance theory by emphasizing the multifaceted nature of private health insurance demand determinants.
- **Impact of COVID-19 Pandemic on Healthcare Financing:** This investigation into the post-COVID private health insurance market evolution provides theoretical insights into the healthcare system adaptability and resilience during a global pandemic. While the pandemic did not directly influence private health insurance coverage rates, the study findings underscore the significance of considering the pandemic broader impact on healthcare financing and access. This theoretical implication highlights the need for healthcare policymakers to proactively plan for future crises and design flexible and agile healthcare financing mechanisms that can respond to external shocks.
- **Policy and international sanctions in healthcare:** The study exploration of the potential role of international sanctions in shaping healthcare systems and private health insurance markets contributes to the theoretical understanding of the broader geopolitical context of healthcare financing. Although the findings did not establish a direct link between sanctions and private health insurance coverage rates, this theoretical implication underscores the importance of considering the global political landscape influence on healthcare affordability and access. Acknowledging the possible indirect effects of international sanctions can inform policymakers about strategies to safeguard healthcare systems from external pressures.
- **Demographic Considerations in Private Health Insurance Demand:** The study focus on demographic factors, such as the percentage of the population over 60 and the unemployment rate, illuminates the demographic dimension of private health insurance demand. This theoretical implication accentuates the significance of considering population characteristics when developing healthcare policies and devising targeted interventions to enhance private health insurance enrolment among specific demographic groups. A deeper understanding of demographic drivers can enhance healthcare financing theories by providing a nuanced perspective on the demand-side dynamics of private health insurance markets.

Overall, the theoretical implications contribute to the healthcare financing literature by expanding the understanding of private health insurance demand determinants, considering spatial interdependence in healthcare systems, and acknowledging the broader geopolitical context that may influence healthcare financing decisions. The theoretical insights gained from this research provide a valuable foundation for future studies in healthcare economics, public policy, and spatial econometrics, promoting evidence-based policymaking and optimizing healthcare financing mechanisms in the post-pandemic era and beyond.

## **5- Conclusion**

In the context of the ever-evolving healthcare landscape post-COVID, this meticulous examination of the private health insurance markets in Albania, Russia, and Malaysia has profound practical implications. By scrutinizing the factors influencing private health insurance coverage rates and considering the complex interplay of international sanctions on healthcare systems, this comprehensive spatial econometric analysis contributes valuable insights to the domain of healthcare financing and policy. These insights hold the potential to serve as the bedrock for informed decision-making and strategic planning in the aftermath of the pandemic. Notably, the investigation sheds light on the transformative shifts occurring in private health insurance coverage rates in the wake of the COVID era. Albanian



measured increases, Russian substantial growth, and Malaysian remarkable surges in private health insurance enrollment illuminate the diverse trajectories these nations are undertaking. These trajectories are guided by a range of factors, including economic indicators, the robustness of healthcare infrastructure, and the weight of government health expenditure. Demographic considerations, such as the proportion of individuals above 60 years of age and unemployment rates, also play a pivotal role in shaping private health insurance demand. The presence of spatial interdependence, as discerned from Moran's Index, further underscores the importance of regional interconnectedness in influencing coverage rates, substantiating the call for regionally informed healthcare policies. Importantly, while COVID-19 may not have directly driven changes in private health insurance coverage rates, the findings cast a spotlight on the pandemic's broader impact on healthcare systems. The imperative of preparedness for future crises and the ever-present need for adaptive, resilient healthcare systems emerge as pressing takeaways. Furthermore, the inquiry into the potential sway of international sanctions on healthcare systems underscores the necessity of factoring geopolitical contexts into financing deliberations. In summary, these study findings not only contribute to scholarly discourse but also beckon stakeholders, policymakers, and practitioners to engage in informed and dynamic scholarship that translates into tangible improvements in healthcare financing and service provision.

This study makes notable theoretical contributions to the domains of healthcare financing, private health insurance, and spatial econometrics. By examining the interconnectedness of neighboring regions in shaping private health insurance markets, this research underscores the spatial dynamics that often influence healthcare choices and resource allocation. The integration of economic indicators and healthcare infrastructure factors as determinants of private health insurance coverage rates advances our understanding of how multifaceted elements collectively impact individuals' decisions to opt for private health insurance. Additionally, the study acknowledges the broader geopolitical context, introducing a novel dimension by considering the potential influence of international sanctions on healthcare financing decisions. This holistic approach emphasizes the necessity of encompassing political and international factors when developing healthcare policies, thereby expanding the theoretical underpinnings of healthcare financing research. As the global healthcare landscape continues to evolve, this study encourages academics, policymakers, and healthcare practitioners to collaborate closely, bridging theory and practice, to forge resilient healthcare systems that effectively cater to the diverse needs of societies worldwide. This engagement in practical scholarship not only shapes policy responses but also facilitates a transformative impact on healthcare financing, ensuring the well-being of communities in an ever-changing world.

In conclusion, this study provides valuable evidence for policymakers and stakeholders to navigate the complexities of the post-COVID private health insurance market in Albania, Russia, and Malaysia. By implementing the proposed policy recommendations and leveraging the theoretical implications, countries can pave the way for a more resilient, equitable, and accessible healthcare system that caters to the diverse needs of their populations. As healthcare financing landscapes evolve, continued research and collaboration among policymakers, academics, and healthcare practitioners remain essential to driving sustainable and patient-centered healthcare systems in the future.

### **5-1- Limitations**

While our study provides valuable insights into the post-COVID development of the private health insurance market in Albania, Russia, and Malaysia, it is essential to acknowledge several limitations that may impact the interpretation of the findings and the generalizability of the results:

- **Extrapolation of the findings:** Our study focused on three countries with distinct socio-economic, political, and healthcare system characteristics. Extrapolating the findings to other countries or regions with different contexts should be done with caution, as healthcare financing dynamics can vary significantly across different settings.
- **Causality and endogeneity:** The cross-sectional nature of our data limits our ability to establish causal relationships between the explanatory variables and private health insurance coverage rates. Endogeneity issues may arise, whereby the variables under study are simultaneously determined and influenced by other unobserved factors.
- **Impact of unobserved variables:** Despite our efforts to include relevant variables, unobserved factors that were not accounted for in the analysis could still impact on private health insurance markets. For instance, individual preferences, cultural norms, and public perception of private insurance could play a role in shaping coverage rates.
- **External factors and dynamic changes:** Our study considered various factors influencing private health insurance coverage rates at a particular point in time. However, external events changing policy landscapes, and unforeseen developments could impact private health insurance markets in the future, making the analysis subject to temporal dynamics.

Despite these limitations, our study serves as an important starting point for understanding the complexities of private health insurance markets in the post-pandemic era. Future research can build upon our findings to explore additional variables, longitudinal data, and dynamic models to provide a more comprehensive understanding of the evolving landscape of healthcare financing and private health insurance. By acknowledging these limitations, a transparent and responsible approach was ensured to interpret and apply the findings in the context of healthcare policy and practice.



## 6- Declarations

### 6-1-Author Contributions

Conceptualization, E.X., J.T., and D.I.P.; methodology, E.X., J.T., and D.I.P.; software, M.S.M. and I.V.N.; validation, S.L., E.V.K., and D.I.P.; formal analysis, I.M., E.X., and D.I.P.; investigation, E.X. and N.V.R.L.; resources, E.V.K.; data curation, J.T.; writing—original draft preparation, M.S.M., N.V.R.L., I.M., O.V.D., and S.L.; writing—review and editing, E.X., J.T., D.I.P., and E.V.K.; visualization, O.V.D.; supervision, J.T.; project administration, J.T.; funding acquisition, J.T. All authors have read and agreed to the published version of the manuscript

### 6-2-Data Availability Statement

The data presented in this study are available in the article.

### 6-3-Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

### 6-4-Institutional Review Board Statement

Not applicable.

### 6-5-Informed Consent Statement

Not applicable.

### 6-6-Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

## 7- References

- [1] Brown, J. R., & Finkelstein, A. (2008). The Interaction of public and private insurance: Medicaid and the long-term care insurance market. *American Economic Review*, 98(3), 1083–1102. doi:10.1257/aer.98.3.1083.
- [2] Islam, S., Islam, T., & Islam, M. R. (2022). New Coronavirus Variants are Creating More Challenges to Global Healthcare System: A Brief Report on the Current Knowledge. *Clinical Pathology*, 15, 2632010 2210755. doi:10.1177/2632010X221075584.
- [3] Sun, S., Xie, Z., Yu, K., Jiang, B., Zheng, S., & Pan, X. (2021). COVID-19 and healthcare system in China: challenges and progression for a sustainable future. *Globalization and Health*, 17(1), 14. doi:10.1186/s12992-021-00665-9.
- [4] Huyen, B. T., & Van Quyet, L. (2022). Russia's Pivot to Asia and Russia-Vietnam Economic Relations in the Early 21<sup>st</sup> Century. *Emerging Science Journal*, 6(6), 1492-1506. doi:10.28991/ESJ-2022-06-06-017.
- [5] Haldane, V., De Foo, C., Abdalla, S. M., Jung, A. S., Tan, M., Wu, S., Chua, A., Verma, M., Shrestha, P., Singh, S., Perez, T., Tan, S. M., Bartos, M., Mabuchi, S., Bonk, M., McNab, C., Werner, G. K., Panjabi, R., Nordström, A., & Legido-Quigley, H. (2021). Health systems resilience in managing the COVID-19 pandemic: lessons from 28 countries. *Nature Medicine*, 27(6), 964–980. doi:10.1038/s41591-021-01381-y.
- [6] Driggin, E., Madhavan, M. V., Bikdeli, B., Chuich, T., Laracy, J., Biondi-Zoccai, G., Brown, T. S., Der Nigoghossian, C., Zidar, D. A., Haythe, J., Brodie, D., Beckman, J. A., Kirtane, A. J., Stone, G. W., Krumholz, H. M., & Parikh, S. A. (2020). Cardiovascular Considerations for Patients, Health Care Workers, and Health Systems during the COVID-19 Pandemic. *Journal of the American College of Cardiology*, 75(18), 2352–2371. doi:10.1016/j.jacc.2020.03.031.
- [7] Roehr, B. (2020). The health of private insurance in the US during covid-19. *BMJ*, m2606. doi:10.1136/bmj.m2606.
- [8] Jakovljevic, M., Mouselli, S., Al Ahdab, S., & Hammoudi Halat, D. (2022). Editorial: Does healthcare financing explain different healthcare system performances and responses to COVID-19? *Frontiers in Public Health*, 10, 1062425. doi:10.3389/fpubh.2022.1062425.
- [9] Piech, K. (2022). Health Care Financing and Economic Performance during the Coronavirus Pandemic, the War in Ukraine and the Energy Transition Attempt. *Sustainability (Switzerland)*, 14(17), 10601. doi:10.3390/su141710601.
- [10] Lexa, F. J., & Lexa, F. J. (2020). Private Equity-Backed Hospital Investments and the Impact of the Coronavirus Disease 2019 (COVID-19) Epidemic. *Journal of the American College of Radiology*, 17(8), 1049–1052. doi:10.1016/j.jacr.2020.05.023.
- [11] Williams, O. D. (2020). COVID-19 and Private Health: Market and Governance Failure. *Development (Basingstoke)*, 63(2–4), 181–190. doi:10.1057/s41301-020-00273-x.

- [12] Jakovljevic, M., Groot, W., & Souliotis, K. (2022). Editorial: Health care financing and affordability in the emerging global markets, Volume II. *Frontiers in Public Health*, 10, 1054409. doi:10.3389/fpubh.2022.1054409.
- [13] Paudel, Y. (2012). A Comparative study of public-private catastrophe insurance systems: Lessons from current practices. *Geneva Papers on Risk and Insurance: Issues and Practice*, 37(2), 257–285. doi:10.1057/gpp.2012.16.
- [14] Doshmangir, L., Bazayar, M., Rashidian, A., & Gordeev, V. S. (2021). Iran health insurance system in transition: equity concerns and steps to achieve universal health coverage. *International Journal for Equity in Health*, 20(1), 37. doi:10.1186/s12939-020-01372-4.
- [15] Samsudin, A., & Prabowo, H. (2022). Community-based health coverage at the crossroad: The Muhammadiyah health fund in Indonesia. *Indonesian Journal of Islam and Muslim Societies*, 12(1), 111–138. doi:10.18326/ijims.v12i1.111-138.
- [16] Barasa, E., Kazungu, J., Nguhiu, P., & Ravishankar, N. (2021). Examining the level and inequality in health insurance coverage in 36 sub-Saharan African countries. *BMJ Global Health*, 6(4), 4712. doi:10.1136/bmjgh-2020-004712.
- [17] Chen, H., Ding, Y., Wang, X., & Yang, Y. (2023). The effect of public insurance policy on the private insurance market: New evidence from a quasi-experiment in China. *Economic Analysis and Policy*, 78, 937–953. doi:10.1016/j.eap.2023.04.031.
- [18] Xiao, R., Ross, J. S., Gross, C. P., Dusetzina, S. B., McWilliams, J. M., Sethi, R. K. V., & Rathi, V. K. (2022). Hospital-Administered Cancer Therapy Prices for Patients with Private Health Insurance. *JAMA Internal Medicine*, 182(6), 603–611. doi:10.1001/jamainternmed.2022.1022.
- [19] Batbold, O., & Pu, C. (2021). Willingness to pay for private health insurance among workers with mandatory social health insurance in Mongolia. *International Journal for Equity in Health*, 20(1), 1–14. doi:10.1186/s12939-020-01343-9.
- [20] Sajadi, H. S., Yahyaee, F., Ehsani-Chimeh, E., & Majdzadeh, R. (2023). The human cost of economic sanctions and strategies for building health system resilience: A scoping review of studies in Iran. *International Journal of Health Planning and Management*, 38(5), 1142–1160. doi:10.1002/hpm.3651.
- [21] Akbarialiabad, H., Rastegar, A., & Bastani, B. (2021). How sanctions have impacted Iranian healthcare sector: A brief review. *Archives of Iranian Medicine*, 24(1), 58–63. doi:10.34172/AIM.2021.09.
- [22] Gray, W. K., Navaratnam, A. V., Day, J., Babu, P., Mackinnon, S., Adelaja, I., Bartlett-Pestell, S., Moulton, C., Mann, C., Batchelor, A., Swart, M., Snowden, C., Dyer, P., Jones, M., Allen, M., Hopper, A., Rayman, G., Kar, P., Wheeler, A., ... Briggs, T. W. R. (2021). Variability in COVID-19 in-hospital mortality rates between National Health Service trusts and regions in England: A national observational study for the Getting It Right First Time Programme. *EClinicalMedicine*, 35, 100859. doi:10.1016/j.eclinm.2021.100859.
- [23] Chaudhry, F. B., Raza, S., Raja, K. Z., & Ahmad, U. (2020). Covid 19 and Bame Health Care Staff: Wrong Place at the Wrong Time. *Journal of Global Health*, 10(2), 1–4. doi:10.7189/jogh.10.020358.
- [24] Costa-i-Font, J., & Vilaplana-Prieto, C. (2023). Health System Trust and Compliance with COVID-19 Restrictions. *SSRN Electronic Journal*. doi:10.2139/ssrn.4375376.
- [25] Warner, M. E., & Hefetz, A. (2012). Insourcing and outsourcing: The dynamics of privatization among U.S. Municipalities 2002–2007. *Journal of the American Planning Association*, 78(3), 313–327. doi:10.1080/01944363.2012.715552.
- [26] Abdrassilov, A., Orynbasarova, Y., & Tvaronaviciene, M. (2023). Exploring Environmental Factors for the Sports Clusters Development. *Journal of Environmental Management and Tourism*, 14(3), 799–810. doi:10.14505/jemt.v14.3(67).19.
- [27] Lambert, D. M., Brown, J. P., & Florax, R. J. G. M. (2010). A two-step estimator for a spatial lag model of counts: Theory, small sample performance and an application. *Regional Science and Urban Economics*, 40(4), 241–252. doi:10.1016/j.regsciurbeco.2010.04.001.
- [28] Belli, P., Gotsadze, G., & Shahriari, H. (2004). Out-of-pocket and informal payments in health sector: Evidence from Georgia. *Health Policy*, 70(1), 109–123. doi:10.1016/j.healthpol.2004.03.007.
- [29] Masiye, F., & Kaonga, O. (2016). Determinants of healthcare utilisation and out-of-pocket payments in the context of free public primary healthcare in Zambia. *International Journal of Health Policy and Management*, 5(12), 693–703. doi:10.15171/ijhpm.2016.65.
- [30] Cohidon, C., El Hakmaoui, F., & Senn, N. (2022). The role of general practitioners in managing the COVID-19 pandemic in a private healthcare system. *Family Practice*, 39(4), 586–591. doi:10.1093/fampra/cmab112.
- [31] Gruber, J. (1998). Unemployment insurance, consumption smoothing, and private insurance: Evidence from the PSID and CEX. *Research in Employment Policy*, 1, 1–43.
- [32] Atella, V., Piano Mortari, A., Kopinska, J., Belotti, F., Lapi, F., Cricelli, C., & Fontana, L. (2019). Trends in age-related disease burden and healthcare utilization. *Aging Cell*, 18(1), 12861. doi:10.1111/accel.12861.

- [33] Franco, C. M., Lima, J. G., & Giovanella, L. (2021). Primary healthcare in rural areas: Access, organization, and health workforce in an integrative literature review. *Cadernos de Saude Publica*, 37(7), 310520. doi:10.1590/0102-311X00310520.
- [34] Gao, C., Feng, Y., Tong, X., Lei, Z., Chen, S., & Zhai, S. (2020). Modeling urban growth using spatially heterogeneous cellular automata models: Comparison of spatial lag, spatial error and GWR. *Computers, Environment and Urban Systems*, 81, 101459. doi:10.1016/j.compenvurbsys.2020.101459.
- [35] Chen, X., Shao, S., Tian, Z., Xie, Z., & Yin, P. (2017). Impacts of air pollution and its spatial spillover effect on public health based on China's big data sample. *Journal of Cleaner Production*, 142, 915–925. doi:10.1016/j.jclepro.2016.02.119.
- [36] Hou, H., & Zhu, Y. (2022). Analysis of spillover effects of regional environmental pollution: an interprovincial study in China based on spatiotemporal lag model. *Environmental Science and Pollution Research*, 29(1), 836–853. doi:10.1007/s11356-021-15739-9.
- [37] Bidanset, P. E., & Lombard, J. R. (2014). Evaluating spatial model accuracy in mass real estate appraisal: A comparison of geographically weighted regression and the spatial lag model. *Cityscape*, 16(3), 169-182.
- [38] Cheng, T. C. (2014). Measuring the effects of reducing subsidies for private insurance on public expenditure for health care. *Journal of Health Economics*, 33(1), 159–179. doi:10.1016/j.jhealeco.2013.11.007.