

Article

Time Series Modeling Analysis of the Development and Impact of the COVID-19 Pandemic on Spa Tourism in Slovakia

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Abstract: Natural healing resources in the form of mineral and thermal waters and climatic conditions, together with a rich history and modern medical procedures, rank Slovakia among the important European countries in the field of spas. At the same time, spa tourism has a significant economic benefit for the country. This study examined the impact of the Coronavirus Disease 2019 (COVID-19) pandemic on spa tourism in Slovakia. The Box-Jenkins methodology was used to model and forecast the time series for selected indicators. The analysis used monthly data on the capacity and performance of spa facilities for 2006–2019 and compared the forecast development for 2020–2021 with the reality as affected by the pandemic. Despite the high quality of the models, the methodology used did not take into account an unexpected event such as a pandemic. Therefore, the models were quite inaccurate and had little predictive value. At the same time, it is clear that the pandemic significantly affected spa tourism.



Citation: Šenková, A.; Košíková, M.; Matušíková, D.; Šambronská, K.; Kravčáková Vozárová, I.; Kotulič, R. Time Series Modeling Analysis of the Development and Impact of the COVID-19 Pandemic on Spa Tourism in Slovakia. *Sustainability* **2021**, *13*, 11476. <https://doi.org/10.3390/su132011476>

Academic Editor: Kisang Ryu

Received: 28 September 2021

Accepted: 15 October 2021

Published: 17 October 2021

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Keywords: medical spas; spa tourism; Slovakia; modeling; time-series; COVID-19

1. Introduction

The therapeutic use of mineral waters has been known since the ancient times. Nations attributed cult significance to them, and even the Romans recognized their healing and relaxing benefits. The development of European spas, based on natural mineral springs, differed from ordinary springs in appearance, taste and temperature. Today, spas and spa tourism in Europe are an important part of a nation's economy, especially in countries considered to be "spa powers" such as Germany, France, Italy and Switzerland. A modern spa treatment, based on local natural resources, is medically supervised and takes into account climate change and the environment [1]. Environment is a key factor of health and well-being tourism destinations and, in fact, at a spa destination interactions between the environment and activities take place [2]. Within Europe, it is currently possible to create regional divisions in the field of spas, but these cannot be definitive or unambiguous. It is also possible to identify regional development trends based on local traditions, resources, attitudes or activities [3].

The Slovak Republic, thanks to its natural healing resources and long traditions, also belongs to the major European spa countries. The spa is part of Slovakia's institutional health care, which means that patients undergo medically verified and certified procedures under the supervision of professional medical staff who are trained in latest techniques in balneology, physical medicine, healthy nutrition and medical rehabilitation. There are currently 21 spa towns in Slovakia, in which 30 spas operate. The most frequently represented legal forms of enterprises are joint-stock companies (20), limited liability companies (3), non-profit organizations (2), state enterprises (2) and three spa treatment institutions belong to the Ministry of the Interior of the Slovak Republic [4]. The conditions for providing this care are regulated by law in Act 538/2005 Coll. on Natural Healing

Waters, Natural Curative spas, spa Sites and Natural Mineral Waters [5]. In the last decade, however, spas have become increasingly perceived as part of tourism. In Slovakia, judging by the revenue it generates and the number of overnight stays, it is a significant part of the overall tourism structure [6].

At the beginning of 2020, the number of overnight stays showed a growing trend [4], but the COVID-19 pandemic changed everything. The first case of the disease was confirmed in Slovakia on 6 March 2020. As of 21 September 2021, 404,982 persons had tested positive by PCR tests and the number of deaths was recorded as 12,589 persons [7]. The pandemic has fundamentally changed the functioning of the country and the quality of life of all its inhabitants. According to Izakova et al. (2020) it was necessary to organize psychosocial assistance for health workers, patients and other inhabitants in a very short time [8]. At the end of October 2020, the Government of the Slovak Republic decided to test the entire adult population for Covid-19 infection, which provoked conflicting reactions in the country [9]. This crisis caused by the COVID-19 pandemic posed significant challenges for tourism, due to domestic and international constraints, which significantly affected the development of tourism demand. This fact constantly provokes a debate about the effects of this crisis on the sustainability of tourism. There is a view that this pandemic crisis situation may represent an opportunity for tourism to become more sustainable, mainly through designing specific politics at the governmental level that support and stimulate sustainable behavior in tourism [10].

The aim of this paper is to examine the impact of the COVID-19 pandemic on spa tourism in Slovakia by analyzing the available time series.

2. Literature Review

2.1. Medical Spa, Wellness and Spa Tourism

The spa is part of many disciplines: anthropology, archeology, hydrology, medicine, chemistry, law, history and economics. In the last case, putting a value on natural healing resources provides local, regional and national economic benefit [6], and currently, spa tourism is being analyzed from various points of view [11–15], including the environment. Sustainable development should direct activities towards environmental balance and protection, and it is interesting to observe how the pandemic has had a positive effect on the environment in the form of less pollution and limiting the use of natural resources, which the further development of spa tourism should recognize.

According to a study carried out at the request of the European Parliament's Committee on Transport and Tourism [16], spa tourism, together with medical and wellness tourism, is part of health tourism because it focuses on the preventive or curative treatment, relaxation or beautification of the body. Medical tourism includes people who travel for treatments or interventions not accessible in their place of residence.

In European countries, where spas are mostly traditional and perceived to be for medical purposes [17], visitors come not only for health, relaxation and the natural environment, but also for social contacts and cultural experiences. This has led to the development of wellness products, which classic spa facilities provide in ever-increasing quantity [18].

According to Smith and Dryglas [19], "many traditional medical spas, especially in Central and Eastern Europe, were originally funded or subsidized by national governments because they provided health services for residents and domestic tourists. However, in recent years, many spas have been underfunded and were expected to attract guests on the free market, including international tourists. This represents a major challenge, as international tourists may expect wellness rather than medical facilities or higher quality facilities than the spas can currently afford to offer" (p. 67).

On the issue of spa development, the region of the V4 countries (Czech Republic, Hungary, Poland and Slovakia) have focused on the international project WellSpaV4 [20] to identify the potential for wellness services and spa tourism and to determine the extent to which traditional spas in these countries are adapted to attract and accommodate commercial guests and international tourists. In all countries, funding from health insurance

companies has been gradually reduced since 1990, and the number of self-payers has been slowly growing. EU funding has mainly helped to rehabilitate and develop the infrastructure, but the project results show that in the V4 countries there are similar problems, particularly insufficient compliance with the quality standards for self-payers and foreign guests and difficulties obtaining qualified staff due to low wages and problems addressing visitors with special needs. The project researchers agreed that the main priority should be to improve infrastructure, and then create new products, especially for self-payers and foreign guests [21]. Detailed results of the analyses for individual countries were published in a special issue of the *International Journal of Spa and Wellness* [14].

The relationship between traditional spas and wellness is also analyzed by Királ'ová [22], who states that while the importance of medical spas is generally recognized in the Czech Republic or Slovakia, wellness spas are often perceived as a secondary activity with or without little impact on health due to insufficient lengths of stay and a lack of treatment complexity. In the Czech Republic, Vavrečková and Vaníček [23] dealt with the analysis of the economic benefits of spa tourism. The development of spa care in connection with changes in legislation (in Czech Republic) was dealt with by Vavrečková, Stuchlíková and Dluhošová [24], and Vystoupil, Šauer and Bobková [25] monitored the relations among spas, spa tourism and wellness tourism. Spa tourism is according to the Short Dictionary of Tourism [26] a type of tourism focused on health-preventive and therapeutic activities under professional supervision in leisure time. The condition for its development is the existence of a natural healing resource. Wellness tourism is defined as recreational, spa and sport activities, aimed at achieving mental and physical health [4]. Most of wellness clients are healthy people and do not need a doctor's supervision. Wellness facilities are classified into the following categories in Slovakia: wellness hotels, wellness complexes, hotels providing wellness programs (wellness is only an additional service) and medical wellness [4].

An alternative to the classic spa treatment and wellness is medical wellness. According to the European Spa Association [27], it combines medical diagnostics and various treatment techniques with elements of wellness that generate the holistic improvement of health, well-being, and subjective perceptions of health and prevention. Specific measures are not the priority but rather the motivation is to maintain a healthy lifestyle. Under qualified guidance, medical wellness customers learn to take responsibility for their health and strengthen it. According to Smith and Diekmann [28], however, well-being is something more. They perceive its relationship to tourism as encompassing a whole range of experiences from various hedonistic forms of tourism to educational cultural tourism.

The activity of natural medical spas in Slovakia, especially in the last decade (according to Eliášová [6]), has been influenced by the commercialization of spa services with a strong focus on self-paying visitors within the framework of health tourism, so they are included in the category of medical facilities. In addition to classic treatment stays, development trends indicate the need to offer new products, such as spa wellness. On the other hand, there are companies that strongly reject the term spa or wellness, preferring instead to focus on expanding spa products as an expansion of medical services or medical spas. Natural medical spas in Slovakia respond to the demand of commercial clients, who prefer short-term, weekly, and weekend stays with a special program. Medical spa stays of 21 or 28 days paid by health insurance companies are evident to an ever-smaller extent [14]. For a short-term treatment stay to be reasonably effective for both the guest and the establishment, some facilities make the stay conditional on a minimum of four nights. When providing medical services in natural medical spas, the protection of the client must be guaranteed, whether a domestic or foreign self-payer or a health insurance company policyholder [6].

In connection with the issues addressed in this paper, we considered it necessary to provide an overview of studies about the Slovak spa tourism market and companies published in international scientific journals and conference proceedings. Kasagrand and Gurňák [11] focused on the evaluation of the importance of spas, travel and wellness from a geographical point of view, and ideas about their typical function in Slovakia. In recent

years, increased attention has been paid to the analysis of the financial situation of spas in Slovakia. Derco and Pavlisinová [29] focused on the relationship between medical and non-medical forms of spa tourism, emphasizing the importance of public health insurance and the traditional use of natural healing springs for continued accommodation at Slovak spas. Litavcová et al. [30] and Štefko et al. [13] dealt with the evaluation of the financial position of all spa facilities in Slovakia using multidimensional statistical methods. Kučerová [31] conducted qualitative research to find out how economic crises affected spa company management in Slovakia, which measures they took, and which they considered to be the most effective. Čabinová et al. [32] compiled a ranking of spa companies based on an evaluation of their efficiency using linear programming. The issue of over tourism in a spa location was explored by Trembošová and Dubcová [33] and Mitříková [34] who made an interesting analysis of the influence of historical events on the visit rate of Bardejov Spa in various periods of its development (in the years of 1814–2016).

2.2. Impact of COVID-19 on Spa Tourism

According to the UN World Tourism Organization [35], the biggest crisis in the history of tourism will continue for a second year. From January to May 2021, arrivals of international tourists were 85% lower than in 2019. World destinations recorded 147 million fewer international arrivals of overnight visitors compared to the same period in 2020, or 460 million fewer than 2019. The COVID-19 pandemic reduced, or even temporarily stopped, all tourism activities, including spa tourism. However, as Szromek states [36], “the situation of health tourism enterprises is somewhat different from other tourism enterprises, as the relationship of these enterprises with the healthcare system provides an opportunity to continue operations, albeit in a different role than the tourism function” (p. 1). According to Ewing [37], for example, the spa industry in Hungary was hit hard by tourist shortages due to the closure of borders, and without governmental support, two-thirds of spas would not have survived 2020. Revenues fell by 70% in 2020 and, despite financial support from the government, 4700 out of 18,000 employees had to be laid off. The transition to new models of operation and the search for opportunities to restore and maintain the activities of spa companies has not been easy. After the pandemic was declared, spa business activity was significantly reduced, and several were closed completely [38]. Already, during 2020, several studies were published on the impact of the pandemic on the spa industry and tourism, with an emphasis on how it can contribute to improving the health of people with COVID-19. Antonelli and Donelli [39] focused on respiratory rehabilitation for patients after COVID-19 within the services and therapies provided in medical tourism. Maccarone et al. [40] compared the population’s interest in balneotherapy in Italy and Japan during the pandemic, emphasizing the effects of balneotherapy on immunity in patients after recovering from COVID-19. They identified a consensus after the release of pandemic pressure with a slight time lag corresponding to the release of pandemic measures in those countries. Kardeş [41] pointed to the situation in Turkey, where spa therapy addresses fatigue, shortness of breath, pain, depression and anxiety, as well as improving the quality of life of those who have had COVID-19. Szromek [36] examined the situation of Polish spa companies, which had their services and therapeutic activities suspended in 2020. Following these measures, part of the spa offered classic spa services as well as additional treatment for recovering patients with no overlap in these services. Navarrete et al. [38] emphasized the position of the National Association of spas, which stated: “water—the main resource of thermal tourism—is not a carrier medium for the spread of the coronavirus. The virus that produces COVID-19 does not live or reproduce in water and neither in the mineral—medicinal ones that characterize the spas. It does not have the capacity to do so because it is an RNA-type virus and can apparently live and reproduce within human cells” (p. 247). This declared support for the spa companies allowed them to carry out their activities after compliance with the measures and led to the statement by Masiero et al. [42] about the importance of spas, especially climatic and balneological operations, during the pandemic. This condition complies

with all national regulations as well as WHO (World Health Organization) regulations. Martínez-Moure and Saz-Peiró [43], however, questioned whether spa treatments could be considered a tool to help in the COVID-19 pandemic. After conducting research their answer was positive. According to Aluculesei et al. [44] there was a question whether tourism in general, and spa tourism in particular, could help overcome this crisis. They concluded that, taking into account the specifics of COVID-19 infection, which mainly affects the respiratory system, medical spas could be a potential cost-effective solution in countries with a long spa tradition. A positive attitude towards providing treatment for recovering COVID-19 patients was also expressed by Maccarone et al. [40]; Kardeş [41]; Martínez-Moure and Saz-Peiró [43] and Chhabra [45].

Based on the analysis, we can state that in Slovakia, as in other countries, the pandemic significantly affected spa businesses and the extent of damage cannot yet be responsibly assessed; nor can we predict with certainty the development of the situation in the future. The benefit for the spas is the approval of post covid stays for people who have overcome COVID-19, which are funded by health insurance. In our opinion, reconditioning and preventive stays can ultimately be cheaper and less burdensome, for example, for public finances than the treatment itself.

3. Materials and Methods

Based on the aim of the work, we set the following hypotheses:

Hypotheses 1 (H1): *There is a statistically significant model, based on which it will be possible to determine the development of the number of guaranteed domestic spa visitors and the number of overnight stays in spa accommodation facilities in Slovakia.*

Hypotheses 2 (H2): *There is a statistically significant difference between the expected and actual development of the monitored indicators.*

The purpose of the paper, therefore, was not to predict the future development of spa tourism, but to find out whether its predicted development before the pandemic differed significantly from what occurred under its influence.

Several sources were used to analyze the position, development and possibility of using the pandemic to influence spa tourism. The main sources included indicators of capacity and performance of spa facilities in Slovakia obtained from publications published on the website of the Ministry of Transport and Construction of the Slovak Republic (annual data on accommodation statistics in spa tourism) [46]. Other data were on request from the Statistical Office of the Slovak Republic (monthly data on the capacity and performance of spa accommodation establishments in Slovakia). Due to the protection of confidential statistical data of a specific reporting unit (spa enterprise), it was not possible to provide individual indicators at the level of statistical units, but only for Slovakia as a whole. The indicators that were the subject of the survey concerned the number of visitors and the number of overnight stays. All indicators were available comprehensively, as well as separately for domestic and foreign visitors. Individual indicators for Slovakia are available at monthly intervals from January 2006 to December 2019. Data for 2005 are only annual. Data for 2020 and 2021 are only available quarterly from the Statistical Office of the Slovak Republic to ensure greater data protection. Data from 2021 are available for the first two quarters only. The presentation of the development of the selected indicators is available throughout the examined period, but to identify the model we used only data up to 2019; data from 2020 were used to compare the forecast of development with reality, during the pandemic.

For the time series analysis, we used exponential smoothing with a simple seasonal model being most common: the Holt–Winters additive and multiplicative exponential equalization [47]. As Litavcová and Jenčová [48] state, a modern method of time series analysis is the application of the Box–Jenkins methodology.

Since time series in tourism are characterized by considerable seasonality, the result is the seasonal model of autoregressive integrated moving averages (SARIMA) model. We

wrote it in the form $(p, d, q) (P, D, Q) s$, where p is the series of autoregressive model; d is the degree of differences; q is the degree of moving average; P is the seasonal series of autoregressive model; D is degree of seasonal differences; Q is the seasonal degree of the moving average; s is the number of seasons in the year. In our case, we considered $s = 12$, meaning 12 months. To determine the quality of the model, we use the Akaike, Schwarz, and Hannan-Quinn information criteria. To determine the validity of the model (accuracy of prediction) we used the mean absolute percentage error MAPE ($\text{MAPE} \leq 10\%$ means a very accurate prognosis) and the Theil mismatch coefficient U [49]. For modeling and analysis, the statistical programs Gretl and SPSS 26 were used.

4. Results

From a more detailed analysis of the development of the number of spa tourism visitors (Figure 1) in the time series, it was possible to observe how the determinants of tourism development in Slovakia affected domestic visitors. Even before 2005, there was a clear increase, which was also affected by Slovakia's entry into the European Union in 2004 and its entry into the Schengen area in 2007. The 2009 financial crisis significantly reduced the number of visitors, while the Arab Spring in 2012 strengthened domestic tourism. The significant growth in the 2019 indicators was probably caused by the introduction of so-called recreational vouchers to support interest in domestic holidays. The appearance of the pandemic caused a drop in visitors that was more significant than in the case of the financial crisis, which we assumed to be simply the result of reduced demand. In the case of the pandemic, reduced demand was complemented by the introduction of anti-epidemiological measures—the complete or partial closure of spas—which primarily affected domestic visitors, the main participants in spa tourism. The reason could be the way Slovakia finances spa care (fully or partially paid stays by a health insurance company or reconditioning stays by employers), or its geographical location among countries with good, well-developed spa tourism (Hungary, Austria, Czech Republic).

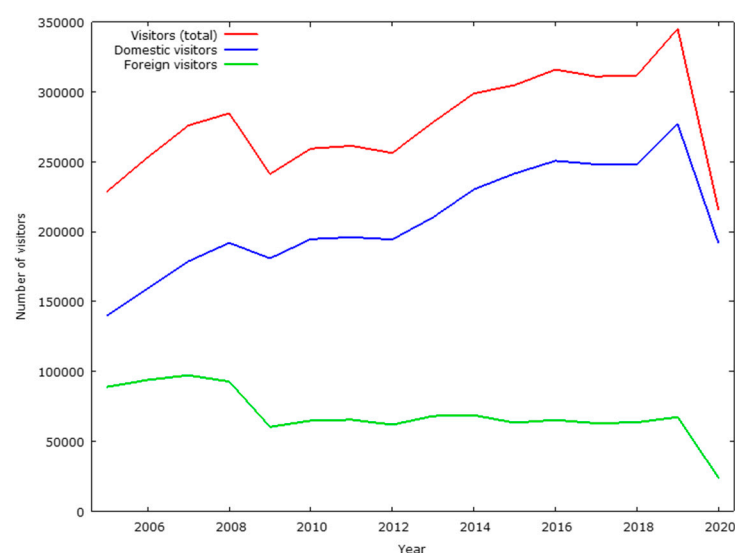


Figure 1. Number of visitors (domestic and foreign) for spa tourism in Slovakia.

The development of the number of overnight stays is similar to the development of the number of visitors. From the point of view of the attractiveness of spa tourism, an interesting indicator is the average length of stay, which is shown in Figure 2. Lower values of this indicator with high attendance signaled high attractiveness. Higher values meant that the spa focused mainly on treatment and less on offering tourist attractions. With regard to the regulation of spa care and the fact that spa tourism consists mainly of domestic visitors, it was possible to assume that the number of overnight stays would be higher than for tourism in general. At the same time, it was necessary to take into account

that the therapeutic effects of treatment usually occur between the second and third week of a stay, which more or less forces the visitors to extend their stay for as long as possible. Although spa products have been significantly introduced in spa companies, they operate almost in parallel with spa services.

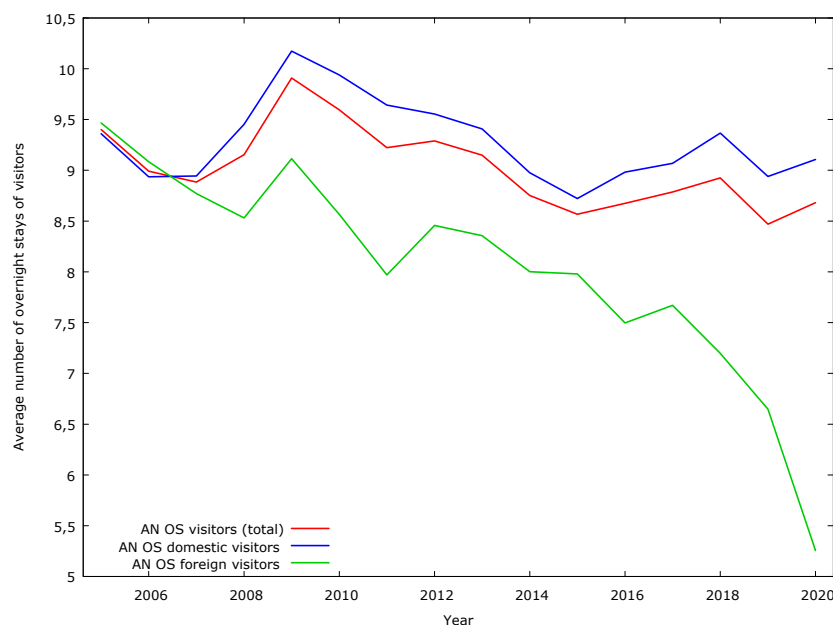


Figure 2. Development of the average number of overnight stays of visitors (domestic and foreign) of spa tourism in Slovakia.

4.1. Models of the Development of the Number of Overnight Stays of Domestic and Foreign Spa Tourism Visitors

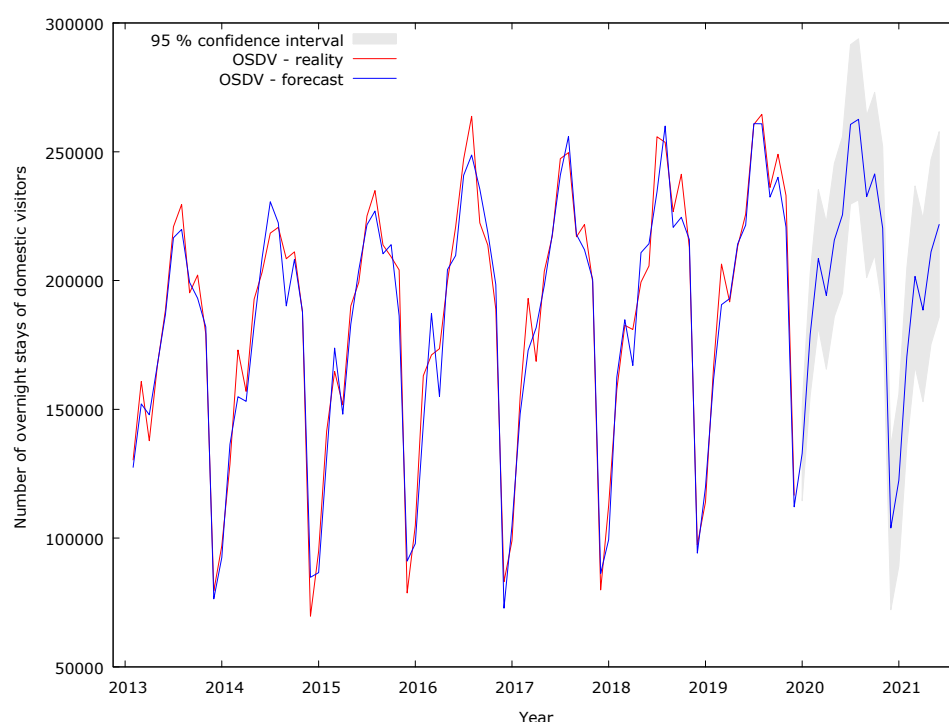
In spa tourism, the number of overnight stays is an important economic indicator, especially due to the specific requirements for a longer stay. Due to the significant share of domestic visitors in spa tourism and the overall number of overnight stays nationwide, we decided to estimate two models—the number of overnight stays for domestic (OSDV) and foreign spa tourism visitors—to prove the expected development for the subsequent 18 months and compare it with the actual development.

Using the Box–Jenkinson methodology from several tested autoregressive models with moving averages, the resulting SARIMA model was selected for the number of overnight stays of domestic spa tourism visitors in the form $(1,0,0) (0,1,1)_{12}$ without a constant. The parameters of the model in concrete are shown in Table 1. The parameters of the model are shown in Table 1. The observed and corresponding model-predicted time series of the number of overnight stays of domestic spa visitors with a 95% confidence interval (gray) are shown in Figure 3. The red curve shows the actual (observed) values of the monitored indicator from January 2006 to December 2019 in the available monthly data. The blue curve represents the values predicted by the model, which are the basis for the January 2020 to June 2021 forecast.

Table 1. Parameters of the model $(1,0,0) (0,1,1)_{12}$ for the development of the number of overnight stays of domestic spa tourism visitors (OSDV).

Variable	Coefficient	Std. Error	Z	p-Value
phi_1	0.8162	0.0506	16.1300	0.0000
Theta_1	−0.5289	0.0803	−6.5850	0.0000
Schwarz criterion (SBC)				3317.0310
Akaike criterion (AIC)				3307.8820
Hannan–Quinn criterion (HQC)				3311.5980
MAPE				5.1707
Theil's U				0.2833
Normality of residual	Chi-square test = 0.5760			0.7496
Autocorrelation	Ljung–Box Q' = 16.3424			0.0902

(Source: own processing in program Gretl).

**Figure 3.** Development and forecast of the number of overnight stays of domestic spa tourism visitors.

All coefficients shown in Table 1 are significant at level $\alpha = 0.05$. The requirement of residue normality was met in the monitored area, which is proved by the chi-square test, which did not reject normality, i.e., the null hypothesis. At the significance level of 0.05, the resulting model did not have a systematic component that would remain undetected in residues, as confirmed by the Ljung–Box residue autocorrelation test. To assess the ability of the model to explain the variability of the observed data, we used the Akaike, Schwarz and Hannan–Quinn information criteria [50]. To measure the accuracy of the estimate, the Theil mismatch coefficient U was used, which can take values from the interval (0.1), $U = 0$ means equality and $U = 1$ means the maximum inaccuracy of the model. We also used MAPE to determine the success of the forecast. This was less than 10%, which meant a very accurate prediction. The results presented in Table 1, thereby, testify in favor of the accuracy of the model. Therefore, we considered the proposed SARIMA model in the form $(1,0,0) (0,1,1)_{12}$ to be statistically significant. The predicted values of the number of overnight stays of domestic visitors to spa accommodation facilities in Slovakia for the 18-month period of are presented in Table 2. The time series stationarity, verified before

using the ARIMA model using the Kwiatkowski–Phillips–Schmidt–Shin (KPSS) test, did not confirm stationarity; therefore, the time series was adjusted by differentiation.

Table 2. Forecast of the number of overnight stays of domestic spa tourism visitors.

Period	Prediction	Std. Error	95% Confidence Interval		Reality
			LCI	UCI	
2020/January	132,889	9,397.316	114,470.09	151,306.89	424,290
2020/February	132,888	12,130.285	155,234.44	202,784.28	
2020/March	208,581	13,650.673	181,826.5	235,336.16	
			451,531.03	589,427.33	
2020/April	194,148	14,575.837	165,580.26	222,716.5	218,524
2020/May	215,746	15,160.904	186,031.01	245,460.66	
2020/June	225,542	15,538.469	195,087.25	255,996.93	
			546,698.52	724,174.09	
2020/July	260,596.4	15,785.002	229,658.35	291,534.42	763,905
2020/August	262,577.3	15,947.133	231,321.51	293,833.13	
2020/September	232,589.8	16,054.241	201,124.1	264,055.57	
			662,103.96	849,423.12	
2020/October	241,416.8	16,125.205	209,811.99	273,021.63	341,236
2020/November	220,301.3	16,172.31	188,604.14	251,998.43	
2020/December	103,916.3	16,203.616	72,157.82	135,674.83	
			470,573.95	660,694.89	
2021/January	122,477.8	17,032.411	89,094.86	155,860.68	172,053
2021/February	170,511.8	17,562.883	136,089.22	204,934.45	
2021/March	201,645.4	17,907.578	166,547.21	236,743.62	
			391,731.29	597,538.75	
2021/April	188,487.1	18,133.587	152,945.92	224,028.27	445,586
2021/May	211,124.9	18,282.609	175,291.68	246,958.19	
2021/June	221,770.4	18,381.222	185,743.85	257,796.92	
			513,981.45	728,783.38	

(Source: own processing in program Gretl) Note: UCI is the upper and LCI is the lower limit of the 95% CI of the forecast.

The SARIMA model for the number of overnight stays of foreign spa tourism visitors in the form $(0,1,1)(0,1,1)_{12}$ without a constant is given in Table 3 together with the specific parameters of the model.

Table 3. Parameters of the model $(0,1,1)(0,1,1)_{12}$ for the development of the number of overnight stays of foreign spa tourism visitors.

Variable	Coefficient	Std. Error	Z	p-Value
phi_1	−0.5275	0.0687	−7.674	0.0000
Theta_1	−0.4594	0.0777	−5.9110	0.0000
Schwarz criterion (SBC)				3079.9770
Akaike criterion (AIC)				3070.8470
Hannan–Quinn criterion (HQC)				3074.555
MAPE				8.2448
Theil's U				0.4695
Normality of residual	Chi-square test = 35.5050			0.0000
Autocorrelation	Ljung-Box Q' = 21.7234			0.01658

(Source: own processing in program Gretl).

All coefficients shown in Table 3 are significant at the level $\alpha = 0.05$. However, the requirement for residue normality was not met, and the model demonstrated the occurrence of a systematic component, which was demonstrated by the significant autocorrelation of residues. Despite the accuracy of the model expressed by the MAPE value and Teil's

coefficient of non-compliance, it was not possible to find a suitable model for forecasting the development of the number of overnight stays of foreign spa tourism visitors.

4.2. Models of the Number of Domestic and Foreign Spa Tourism Visitors

Great attention was also paid to the number of visitors to accommodation establishments, including spas, especially due to the introduction of measures to increase domestic tourism (e.g., recreational vouchers). In this paper, we tried to find a suitable model to predict the number of domestic spa tourism visitors. However, using the Box–Jenkins methodology, it was not possible to find a suitable model that would meet the necessary conditions. All tested SARIMA models showed the presence of a systematic component, while some of the models did not even meet the requirement of residue standards. The Winters multiplicative model of exponential equalization of the time series, the parameter of which is given in Table 4, was chosen as the most suitable model for forecasting the number of domestic visitors. The SPSS 26 program found the balancing constants of the Winters multiplicative exponential balancing with limits of the 95% confidence interval for the variable number of domestic visitors. The model explains 93.2% variability. However, “stationary R_S^2 is a more appropriate parameter to estimate the total variance over a time series if that series contains a trend or seasonality” [51] (p. 5).

Table 4. Parameters of Winters multiplicative model for the development of the number of domestic spa tourism visitors.

Alpha (Level)	Gamma (Trend)	Delta (Season)	MAPE	BIC	Autocorrelation of Residues		R_S^2
					Ljung-Box Q'	Sign.	
0.3020	0.0010	0.1630	5.380	14.332	25.031	0.0510	0.517

(Source: own processing in program SPSS 26). Note: BIC is the Bayesian information criterion.

The observed and corresponding model-predicted values of the number of domestic spa tourism visitors time series with a 95% confidence interval (UCI and LCI shown by a dashed gray line) are shown in Figure 4.

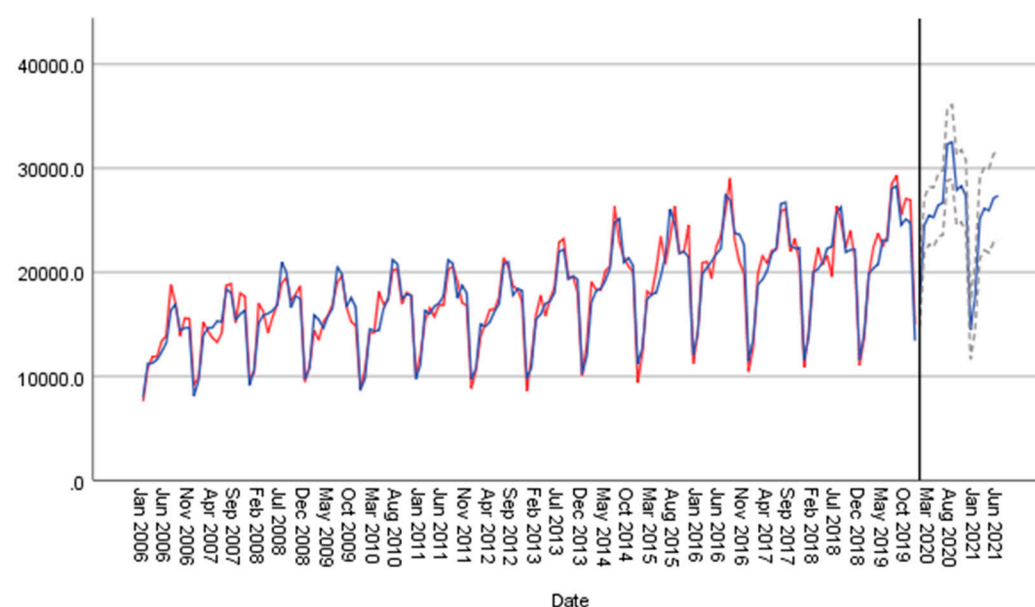


Figure 4. Development and forecast of the number of domestic spa tourism visitors. (Source: own processing in program SPSS 26).

The predicted values of the number of domestic visitors in spa accommodation establishments in Slovakia are presented in Table 5. Autocorrelations and partial autocorrelations are not significant. Residues have a normal distribution.

Table 5. Forecast of the number of domestic spa tourism visitors.

Period	Prediction	95% Confidence Interval		Reality
		LCI	UCI	
2020/January	17,203.7	14,762.3	19,645.1	50,129
2020/February	24,494.0	21,836.7	27,151.2	
2020/March	25,460.3	22,679.4	28,241.3	
	67,158.0	59,278.4	75,037.7	
2020/April	25,261.6	22,391.7	28,131.5	
2020/May	26,443.9	23,436.7	29,451.2	
2020/June	26,665.5	23,560.7	29,770.4	21,115
	78,371.1	69,389.1	87,353.1	
2020/July	32,333.3	28,846.8	35,819.9	
2020/August	32,512.7	28,940.7	36,084.7	91,528
2020/September	27,891.6	24,522.3	31,260.8	
	92,737.6	82,309.7	103,165.5	
2020/October	28,293.9	24,821.9	31,765.8	29,168
2020/November	27,322.0	23,838.3	30,805.7	
2020/December	14,437.8	11,639.1	17,236.5	
	70,053.6	60,299.3	79,808.0	15,678
2021/January	17,658.1	14,486.7	20,829.5	
2021/February	25,139.4	21,286.5	28,992.3	
2021/March	26,129.8	22,119.2	30,140.4	49,718
	68,927.3	57,892.4	79,962.3	
2021/April	25,924.4	21,868.9	29,979.9	
2021/May	27,136.2	22,896.7	31,375.8	
2021/June	27,362.1	23,038.7	31,685.5	
	80,422.8	67,804.3	93,041.2	

(Source: own processing in program SPSS 26).

Table 6 presents a simple seasonal model of the forecast of foreign spa tourism visitors. The model explains 88.6% of the variability.

Table 6. Parameters of Simple Seasonal model for the development of the number of foreign spa tourism visitors.

Alpha (Level)	Delta (Season)	MAPE	BIC	Autocorrelation of Residues		R_s^2
				Ljung-Box Q'	Sign.	
0.5000	0.0000	7.4910	12.627	22.014	0.1430	0.6120

(Source: own processing in program SPSS 26).

The observed and corresponding model-predicted values of the time series of the number of foreign spa tourism visitors with a 95% confidence interval (LCI and UCI shown by a dashed gray line) are shown in Figure 5.

Predicted values of the number of foreign visitors in spa accommodation establishments in Slovakia are presented in Table 7. Autocorrelations and partial autocorrelations are not significant. Residues have a normal distribution.

Tables 2, 5 and 7 clearly show the onset of the pandemic and the implementation of measures. LCI and UCI indicate the expected values of the 95% confidence interval; the last column again shows the specific value of the given indicator for the given quarter of the year. The model we proposed with a confidence interval assumed “correct” values only in the third quarter of 2020. During this period, the first phase of the pandemic subsided, and there was a gradual reduction in measures. It is natural that the closure of spa facilities would have a significant effect on the number of domestic overnight stays. At this time, the spa was either not allowed to accept new visitors, or later (when the measures were relaxed) it was only possible to accommodate patients who belonged to so-called Group A (group where the spa stay is fully covered by the health insurance) under strict epidemiological conditions. Although it represents a significant share of the overnight domestic spa visitors,

it was still unable to cover the losses. Several visitors either shortened their stay or did not stay at all. The main reasons were either fear of illness in public areas or the strict isolation that establishments had to put into practice.

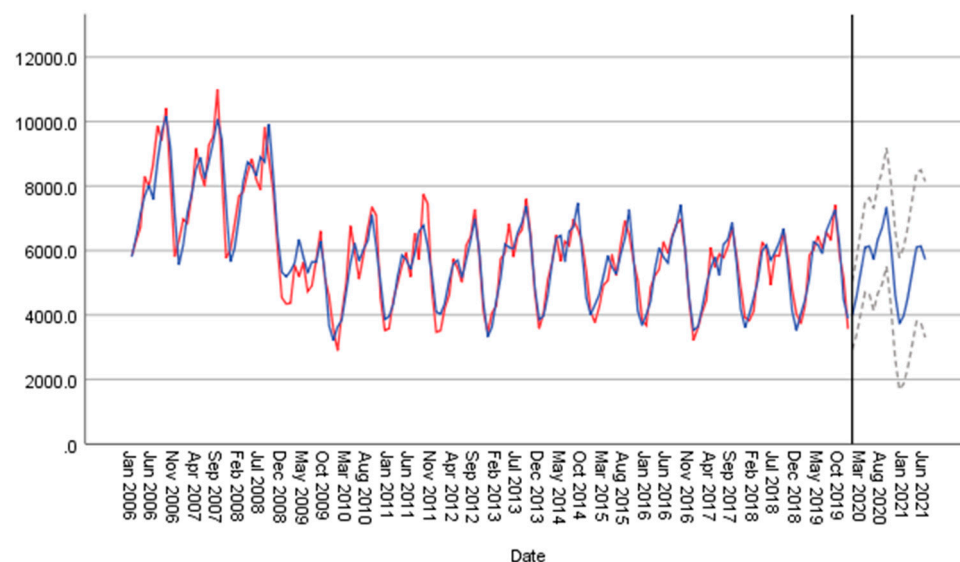


Figure 5. Development and forecast of the number of foreign spa tourism visitors. (Source: own processing in program SPSS 26).

Table 7. Forecast of the number of foreign spa tourism visitors.

Period	Prediction	95% Confidence Interval		Reality
		LCI	UCI	
2020/January	3982.7	2925.6	5039.8	9762
2020/February	4574	3392.3	5755.7	
2020/March	5337.1	4042.8	6631.4	
	13,893.8	10,360.7	17,426.9	
2020/April	6102.5	4704.6	7500.4	
2020/May	6137.1	4642.8	7631.5	
2020/June	5724.5	4139.6	7309.4	1572
	17,964.1	13,487	22,441.3	
2020/July	6356.5	4685.9	8027.1	
2020/August	6714.6	4962.5	8466.6	11,597
2020/September	7342.6	5512.7	9172.5	
	20,413.7	15,161.1	25,666.2	
2020/October	6234.4	4329.8	8139	
2020/November	4649.3	2672.8	6625.8	938
2020/December	3729.3	1683.5	5775.1	
	14613	8686.1	20,539.9	
2021/January	3982.7	1869.8	6095.6	872
2021/February	4574	2396.1	6751.9	
2021/March	5337.1	3096.1	7578.1	
	13,893.8	7362	20,425.6	
2021/April	6102.5	3800.1	8404.9	2290
2021/May	6137.1	3775	8499.3	
2021/June	5724.5	3304	8145	
	17,964.1	10,879.1	25,049.2	

(Source: own processing in program SPSS 26).

The most significant change compared to the model was the number of foreign visitors and their overnight stays. These indicators were not only influenced by the measures taken in Slovakia, but also in the country where the visitors come from. Although the share of foreign spa tourists was significantly lower compared to domestic visitors, more significant

changes would probably be observed in the revenues of spa companies, as it is foreign visitors who contribute significantly. A comparison of the pandemic years 2020 and 2021 would be interesting. The real value of the indicators was that for the same period for both years they were lower than predicted, but in the case of 2020, it was much more visible. If we took into account the fact that the prediction model tended to be inaccurate over time, it is clear that the first phase of the pandemic had the most impact on spa tourism indicators, not only because of the measures taken but also because of people's reactions. For example, based on personal interviews, the fear of the first phase was often replaced by frustration in the second.

5. Discussion

The aim of this paper was to examine the impact of the COVID-19 pandemic on the field of spa tourism in Slovakia by modeling the time series of its development. We assumed the existence of a statistically significant model, based upon which it was possible to determine the development of the number of domestic and foreign spa visitors and the number of overnight stays in spa accommodation facilities. This hypothesis was confirmed, while the SARIMA models, Winters multiplicative model and a simple seasonal model proved to be the most suitable for predicting the development of the indicators. This was also supported by the research of Saayman and Botha [52], according to whom the most accurate models were SARIMAs due to the occurrence of seasonality in the tourist arrival. Their research also showed that nonlinear predictions such as the unobserved components model, smooth transition autoregressive model and singular spectrum analysis were more accurate than the linear model (SARIMA), which showed predominance only in short-term forecasts when there were no structural changes in the time series. This may have explained the reasons why, despite the high quality and validity of the prediction models, the predicted values differed significantly from the real ones. Several authors have modeled time series in tourism using exponential smoothing, such as Mondaca-Marino et al. [53] and He et al. [54]. However, in their work, they used the model to predict the values of indicators that did not take into account the onset of the pandemic. However, the shortcomings in the use of individual methods were evident even earlier. For example, Wu et al. [55] focused on the design of a new hybrid approach SARIMA + LSTM (long short-term memory) for better accuracy.

The analysis of time series using the Box–Jenkins methodology was based only on past data or development, so it could not predict unexpected situations that may or may not reflect the impact of indicators or changes in other countries, for example: how spa attendance was affected by the introduction of anti-epidemic or other policies. This method of developmental analysis can, thereby, be quite inaccurate, and the inaccuracy can be increased over a longer forecast (one year or more), especially if there were not the data available for a sufficiently long period. The limits of our research were the use of the methodology to determine the model of spa tourism development, which was compared with reality.

The impossibility of influencing the situation represented a disadvantage and contributed to a possible lack of research. Although we now know that a third phase of the pandemic may occur, the spa companies themselves cannot directly influence the government measures but can only indirectly prepare them. A certain limitation was also the view of the complex development of spa tourism in Slovakia. A similar analysis could be more appropriate for individual enterprises, which was not possible due to the personal data protection of the spa facility or the reluctance of some to co-operate. Spa companies in Slovakia can differ significantly in their preferred clientele, method of payment for a spa stay or location, and spa treatment. For instance, Rajecké Teplice spa is mainly known for the number of self-payers, whose stay was the most limited during the pandemic. On the other hand, climatic spas had an advantage in the form of highly probable post-COVID visitors.

This paper, thus, produced two main research results. On the one hand, it provided a reference for the use of the forecasting methods for future research. It also showed the

largest shortcomings in areas that the methods did not take into account. On the other hand, it indicated how significantly the pandemic affected spa tourism.

6. Conclusions

The current epidemiological situation brought unexpected problems to the tourism industry. The conditions and possibilities of travel, the motives for travel, and the behavior of visitors all changed. This forced the already developing tourism industry to be even more flexible. Tourism, thus, remains an area with significant opportunities and potential for further development. Forecasting the development of spa tourism was a desirable determinant in the planned strategy of this sector. Knowledge of the expected level of selected indicators helps evaluate decision-making at various levels: from state policy to the decisions of individuals. Based on this development, it is possible to predict development trends, and thereby understand the needs, preferences and behavior of visitors. Therefore, one of the most important tasks of tourism management and marketing is the forecasting of tourism indicators, which begins in the planning phase and determines basic goals and ways of achieving them [50,56].

This paper did not focus on creating a predictive model, but rather on pointing out, how models based only on past events may be inaccurate. Several models were tested, of which we presented only those that met the conditions of time series modeling. We also presented a prediction of selected indicators for 18 months, which we compared with reality after the onset of the pandemic. Based on available information, scientific papers and statements from leading policy makers as well as spa tourism representatives, we assumed that the pandemic significantly affected tourism in all its areas. Individual spa establishments had to close or restrict the use of spa and wellness treatments. Since we modeled the development of spa tourism indicators based only on past data, the actual situation was quite different from the prediction. This did not prove a flaw in the model, but merely showed how difficult it is to predict a future full of unexpected and unpredictable changes.

Author Contributions: Conceptualization, A.Š. and M.K.; methodology, A.Š. and M.K.; software, M.K.; validation, A.Š., M.K. and D.M.; formal analysis, I.K.V. and R.K.; investigation, A.Š., D.M. and K.Š.; resources, A.Š., M.K. and K.Š.; data curation, M.K.; writing—original draft preparation, A.Š., M.K. and D.M.; writing—review and editing, A.Š., R.K. and I.K.V.; visualization, A.Š. and D.M.; supervision, R.K. and I.K.V.; project administration, I.K.V. and R.K.; funding acquisition, R.K. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the Cultural and Educational Grant Agency of the Ministry of Education, Science, Research and Sport of the Slovak Republic, grant number KEGA 024PU-4/2020; by the Scientific Grant Agency of the Ministry of Education, Science, Research, and Sport of the Slovak Republic and the Slovak Academy of Sciences, grant number VEGA 1/0648/21.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Acknowledgments: The authors also thank the journal editor and anonymous reviewers for their guidance and constructive suggestions.

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

References

1. Knopp, K.; Goulli, R.; Mikeš, F. *Lázeňství—Ekonomika a Management. [Spa—Economics and Management]*, 1st ed.; Grada Publishing: Prague, Czechia, 1999; p. 232.
2. Plzáková, L.; Crespo Stupková, L. Environment as a Key Factor of Health and Well-Being Tourism Destinations in Five European Countries. *IBIMA Bus. Rev.* **2019**, 611983. [[CrossRef](#)]
3. Smith, M.; Puczkó, L. *Health, Tourism and Hospitality; Wellness, Spas and Medical Travel*, 2nd ed.; Routledge: New York, NY, USA, 2013; p. 224.

4. Šenková, A.; Mitříková, J. *Technológia Kúpeľníckych Služieb. [Technology of Spa Services]*, 1st ed.; Bookman: Prešov, Slovakia, 2020; p. 170.
5. Act on Natural Healing Waters, Natural Curative Spas, Spa Sites and Natural Mineral Waters. No. 538/2005 Coll. Available online: <https://www.zakonypreludi.sk/zz/2005-538> (accessed on 11 October 2021).
6. Eliašová, D. *Slovenské Kúpeľníctvo v 20. Storočí. [Slovak Spas in the 20th Century]*, 1st ed.; Ekonóm: Bratislava, Slovakia, 2009; p. 202.
7. Coronavirus (COVID-19) in the Slovak Republic. Available online: <https://korona.gov.sk/en/> (accessed on 10 October 2021).
8. Izakova, L.; Breznoscakova, D.; Jandová, K.; Valkucakova, V.; Bezakova, G.; Suvada, J. What mental health experts in Slovakia are learning from COVID-19 pandemic? *Indian J. Psychiatry* **2020**, *62*, 459–466. [CrossRef] [PubMed]
9. Holt, E. Covid-19 testing in Slovakia. *Lancet Infect. Dis.* **2021**, *21*, 32. [CrossRef]
10. Varzaru, A.A.; Bocean, C.G.; Cazacu, M. Rethinking Tourism Industry in Pandemic COVID-19 Period. *Sustainability* **2021**, *13*, 6956. [CrossRef]
11. Kasagrandá, A.; Gurnák, D. Spa and Wellness Tourism in Slovakia (A Geographical Analysis). *Czech J. Tour.* **2017**, *6*, 27–53. [CrossRef]
12. Smith, M.; Puczkó, L. More than a special interest: Defining and determining the demand for health tourism. *Tour. Recreat. Res.* **2015**, *40*, 205–219. [CrossRef]
13. Štefko, R.; Jenčová, S.; Vašaničová, P. The Slovak Spa Industry and Spa Companies: Financial and Economic Situation. *J. Tour. Serv.* **2020**, *11*, 28–43. [CrossRef]
14. Derco, J. Spa tourism in the Slovak Republic. *Int. J. Spa Wellness* **2020**, *3*, 187–197. [CrossRef]
15. Derco, J.; Romaniuk, P.; Cehlár, M. Economic Impact of the Health Insurance System on Slovak Medical Spas and Mineral Spring Spas. *Sustainability* **2020**, *12*, 3384. [CrossRef]
16. Mainil, T.; Eijgelaar, E.; Klijs, J.; Nawijn, J.; Peeters, P. *Research for TRAN Committee—Health Tourism in the EU: A General Investigation*; European Parliament, Policy Department for Structural and Cohesion Policies: Brussels, Belgium, 2017; Available online: <https://doi.org/10.2861/951520> (accessed on 12 September 2021).
17. Jakubíková, D.; Vildová, E.; Janeček, P.; Tluchoř, J. *Lázeňství, Management a Marketing. [Medical Spa, Management and Marketing]*, 1st ed.; Grada Publishing: Prague, Czechia, 2019; p. 368.
18. Mitříková, J.; Sobeková Voľanská, M.; Šenková, A.; Parová, V.; Kaščáková, Z. Bardejov Spa: The analysis of the visit rate in the context of historical periods of its development from 1814 to 2016. *Econ. Ann.-XXI* **2017**, *167*, 57–62. [CrossRef]
19. Smith, M.K.; Dryglas, D. Editorial for the Special Issue of International Journal of Spa and Wellness Challenges for the Spa Sector: Transitioning from Medical to Wellness Services. *Int. J. Spa Wellness* **2021**, *3*, 67–68. [CrossRef]
20. WellSpaV4. The WellSpaV4 Project. Available online: https://www.infota.org/wellspav4konf/index.html#project_desc (accessed on 26 March 2021).
21. Smith, M.K. WellSpaV4 Project Report. Opportunities and Challenges for V4 Spas. Available online: <https://www.infota.org/wellspav4konf/dl/v4-project-report.pdf> (accessed on 26 March 2021).
22. Királyová, A. Medical Spa and Wellness Spa—Where are they Heading? The Case of the Czech Republic. In *Crafting Global Competitive Economies: 2020 Vision Strategic Planning and Smart Implementation, Proceedings of the 24th International Business-Information-Management-Association Conference (IBIMA), Milan, Italy, 6–7 November 2014*; Soliman, K.S., Ed.; IBIMA: Norristown, PA, USA; pp. 516–526.
23. Vavrečková, E.; Vaníček, J. Význam lázeňství a wellness pro současný cestovní ruch v období změn. [The importance of spa and wellness for today's tourism in a period of change]. In *Proceedings of the 5th International Colloquium on Tourism, Brno, Czechia, 11–12 September 2014*; Holešínská, A., Ed.; Masaryk University: Brno, Czechia, 2014; pp. 92–113. Available online: <https://www.econ.muni.cz/do/econ/soubory/katedry/kres/3910085/10619195/sbornik-kolokviumCR2014.pdf> (accessed on 8 August 2021).
24. Vavrečková, E.; Stuchlíková, J.; Dluhošová, R. The Results of the Development of Balneal Care Provision and the State of the Czech Spa Industry in Connection with the Chances in Segislation. *Czech J. Tour.* **2017**, *6*, 93–104. [CrossRef]
25. Vystoupil, J.; Šauer, M.; Bobková, M. Spa, Spa Tourism and Wellness Tourism in the Czech Republic. *Czech J. Tour.* **2017**, *6*, 5–26. [CrossRef]
26. Gúčík, M.; Kmeco, L.; Kučerová, J.; Malachovský, A.; Maráková, V.; Oriška, J.; Patúš, P.; Raši, Š.; Tomášová, A.; Vetráková, M. *Krátky Slovník Cestovného Ruchu. [Short Dictionary of Tourism]*, 1st ed.; Slovensko-švajčiarske združenie pre rozvoj cestovného ruchu: Banská Bystrica, Slovakia, 2004; p. 175.
27. EuropeSpa. Medical Spa & Wellness. Available online: <https://europespa.eu/medical-spa-wellness/medical-wellness/> (accessed on 30 August 2020).
28. Smith, M.K.; Diekmann, A. Tourism and wellbeing. *Ann. Tour. Res.* **2017**, *66*, 1–13. [CrossRef]
29. Derco, J.; Pavlisinová, D. Financial position of medical spas—The case of Slovakia. *Tour. Econ.* **2016**, *23*, 867–873. [CrossRef]
30. Litavcová, E.; Jenčová, S.; Košíková, M.; Šenková, A. Implementation of multidimensional analytical methods to compare performance between spa facilities. In *Proceedings of the 12th International Days of Statistics and Economics, Prague, Czechia, 6–8 September 2018*; Melandrium: Slaný, Czechia, 2018; pp. 1070–1079.

31. Kučerová, J. Impact of economic crisis on the spa businesses in Slovakia. In Proceedings of the 2nd International Scientific Conference Tourism in Southern and Eastern Europe 2013: Crisis—A Challenge of Sustainable Tourism Development, Opatija, Croatia, 15–18 May 2013; Jankovic, S., Jurdana, D.S., Eds.; University Rijeka, Faculty of Tourism and Hospital Management: Rijeka, Croatia, 2013; pp. 175–183.
32. Čabinová, V.; Fedorčíková, R.; Jurová, N. Innovative methods of evaluating business efficiency: A comparative study. *Mark. Manag. Innov.* **2021**, *2*, 133–145. [\[CrossRef\]](#)
33. Trembošová, M.; Dubcová, A. Prejavy a dôsledky overturizmu v kúpeľnom mieste. [Manifestations and Consequences of Over Tourism in a Spa Place]. In Proceedings of the 15th International Conference, Jihlava, Czechia, 4–5 March 2020; Linderová, I., Ed.; College of Polytechnics: Jihlava, Czech Republic; pp. 246–255. Available online: <https://kcr.vspj.cz/uvod/archiv/konference/aktualni-problemy-cestovniho-ruchu-2020> (accessed on 8 August 2021).
34. Mitriková, J. Analysis of the attendance of Bardejov Spa Based on the evaluation of archived unpublished documents. *J. Manag. Bus.* **2020**, *12*, 39–51.
35. UNWTO. International Travel Largely on Hold Despite Uptick in May. Available online: <https://www.unwto.org/international-travel-largely-on-hold-despite-uptick-in-may> (accessed on 21 July 2021).
36. Szromek, A.R. The Role of Health Resort Enterprises in Health Prevention during the Epidemic Crisis Caused by COVID-19. *J. Open Innov. Technol. Mark. Complex.* **2021**, *7*, 133. [\[CrossRef\]](#)
37. Ewing, I. Hungary's Celebrated Spas on the Brink Because of Coronavirus. Available online: <https://newseu.cgtn.com/news/2020-10-31/Hungary-s-celebrated-spas-on-the-brink-because-of-coronavirus-V1dpyMyESs/index.html> (accessed on 31 October 2020).
38. Navarrete, A.P.; Shaw, G. Spa tourism opportunities as strategic sector in aiding recovery from Covid-19: The Spanish model. *Tour. Hosp. Res.* **2021**, *21*, 245–250. [\[CrossRef\]](#)
39. Antonelli, M.; Donelli, D. Respiratory rehabilitation for post COVID-19 patients in spa centers: First steps from theory to practice. *Int. J. Biometeorol.* **2020**, *64*, 1811–1813. [\[CrossRef\]](#)
40. Maccarone, M.C.; Kamioka, H.; Cheleschi, S.; Tenti, S.; Masiero, S.; Kardes, S. Italian and Japanese public attention toward balneotherapy in the COVID-19 era. *Environ. Sci. Pollut. Res.* **2021**, *29*, 1–9. [\[CrossRef\]](#)
41. Kardes, S. Public interest in spa therapy during the COVID-19 pandemic: Analysis of Google Trends data among Turkey. *Int. J. Biometeorol.* **2021**, *65*, 945–950. [\[CrossRef\]](#) [\[PubMed\]](#)
42. Masiero, S.; Maccarone, M.C.; Magro, G. Balneotherapy and human immune function in the era of COVID-19. *Int. J. Biometeorol.* **2020**, *64*, 1433–1434. [\[CrossRef\]](#) [\[PubMed\]](#)
43. Martínez-Moure, O.; Saz-Peiró, P. The role of spas during the COVID-19 crisis. *Med. Natur.* **2021**, *15*, 61–68.
44. Aluculesei, A.C.; Nistoreanu, P.; Avram, D.; Nistoreanu, B.G. Past and Future Trends in Medical Spas: A Co-Word Analysis. *Sustainability* **2021**, *13*, 9646. [\[CrossRef\]](#)
45. Chhabra, D. Transformational Wellness Tourism System Model in the Pandemic Era. *Int. J. Health Manag. Tour.* **2020**, *5*, 76–101. [\[CrossRef\]](#)
46. Ministry of Transport and Construction of the Slovak Republic. Kúpeľný cestovný Ruch. Kapacity a Výkony Kúpeľných Ubytovacích Zariadení na SLOVENSKU za Roky 2005–2017. [Spa Tourism. Capacities and Performances of Spa Accommodation Facilities in Slovakia in the Years 2005–2017]. Available online: <https://www.mindop.sk/ministerstvo-1/cestovny-ruch-7/statistika/kupelny-cestovny-ruch> (accessed on 15 July 2018).
47. Litavcová, E.; Košíková, M. Predikcia a komparácia priemerných miezd v odvetviach cestovného ruchu so mzdami v iných odvetviach. [Prediction and comparison of average wages in tourism industries with wages in other industries]. In *Non-Conference Peer-Reviewed Collection of Scientific Works*; Litavcová, E., Popovičová, M., Eds.; Prešov University: Prešov, Slovakia, 2018; pp. 48–61. Available online: <https://ezproxy.pulib.sk:2067/web/kniznica/elpub/dokument/Litavcova1> (accessed on 12 September 2021).
48. Litavcová, E.; Jenčová, S. *Analytický Pohľad na Problém Chudoby a Nezamestnanosti v Podmienkach Slovenska*. [Analytical View on the Problem of Poverty and Unemployment in the Conditions of Slovakia], 1st ed.; Tribun EU: Brno, Czechia, 2014; p. 152.
49. Litavcová, E.; Jenčová, S.; Vašaničová, P. On Modelling the Evolution of Financial Metrics in Decision Making Unit in the Electronics Industries. In Proceedings of the 35th International Conference on Mathematical Methods in Economics, Hradec Králove, Czechia, 13–15 September 2017; Pražák, P., Ed.; University of Hradec Králove: Hradec Králove, Czechia, 2017; pp. 408–413.
50. Vašaničová, P. Vývoj indexu tržieb za ubytovacie a stravovacie služby. [Development of the index of sales for accommodation and food services]. In *Predikčná Analýza Finančnej Situácie Nefinančných Korporácií*. [Predictive Analysis of the Financial Situation of Non-Financial Corporations]; Bookman: Prešov, Slovakia, 2019; pp. 40–47.
51. Litavcová, E.; Jenčová, S. Štatistické modely vo finančnom riadení firmy. [Statistical models in the financial management of the company]. *Finančné trhy [Financ. Mark.]* **2014**, *4*, 1336–5711. Available online: http://www.derivat.sk/files/2014%20financne%20trhy/Okt_2014_FT_Statis_Modely_Litavcova_Jencova.pdf (accessed on 21 December 2014).
52. Saayman, A.; Botha, I. Non-linear models for tourism demand forecasting. *Tour. Econ.* **2017**, *23*, 594–613. [\[CrossRef\]](#)
53. Mondaca-Marino, C.; Arriagada-Milaman, A.; Montecinos-Astorga, A.; Colther-Marino, C. Modelamiento y pronóstico de la demanda turística a nivel regional en Chile: Un análisis con modelos SARIMA. *Turismo* **2020**, *9*, 1–12.
54. He, K.; Ji, L.; Wu, C.W.D.; Tso, K.F.G. Using SARIMA-CNN-LSTM approach to forecast daily tourism demand. *J. Hosp. Tour. Manag.* **2021**, *49*, 25–33. [\[CrossRef\]](#)

-
55. Wu, D.C.W.; Ji, L.; He, K.; Tso, K.F.G. Forecasting tourist daily arrivals with a hybrid Sarima-Lstm approach. *J. Hosp. Tour.* **2021**, *45*, 52–67. [[CrossRef](#)]
 56. Kiráľová, A.; Straka, I. *Vliv Globalizace na Marketing Destinace Cestovního Ruchu. [The Impact of Globalization on Tourism Destination Marketing]*, 1st ed.; Ekopress: Prague, Czechia, 2013; p. 228.