

DYNAMIC ANALYSIS OF DEMAND FOR SPA TOURISM IN HARGHITA COUNTY IN THE PERIOD 2012-2021

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RESEARCH ARTICLE

Abstract

Analyzing the absolute and relative dynamics of arrivals in the period 2012-2021, in the resort Borsec, it could be observed that their number increased significantly in 2021 compared to 2012, by approximately 170%. In the Tuşnad Baths resort, it was observed that compared to the base year, in 2021, the number of arrivals increased significantly by 114.8%. In total, the average level of arrivals in the Tuşnad Baths resort registered 30.1 thousand people, with an average absolute increase of approximately 1.9 thousand people and a relative increase of 8.8%. Analyzing the absolute and relative dynamics of overnight stays in the period 2012-2021, in the Borsec resort, it could be observed that their number also increased by 83.55% in 2021 compared to 2012. Overall, the average level recorded approximately 13 thousand overnight stays, with an absolute average increase of approximately 635 overnight stays, and a relative increase of 6.9%. Overall, the average level registered 122.5 thousand overnight stays, with an absolute average decrease of 2.6 thousand overnight stays and a relative decrease of 2.5%. The average length of stay in the resort of Borsec fluctuated throughout the analyzed period (2012-2021), in 2015, the highest value was recorded (2.87). In the Tuşnad Baths resort, a permanent decrease in the average length of stay was observed throughout the analyzed period compared to the base year 2012; the most important decrease was recorded in 2020 (pandemic year) by approximately 68%.

Keywords: arrivals, overnight stays, average length of stay, absolute dynamics, relative dynamics

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INTRODUCTION

Harghita County is considered one of the most beautiful counties in the country, thanks to resorts at the foot of the mountains. Several forms of tourism are practiced in this county, including spa tourism, thanks to mineral waters and existing spa factors.

Tuşnad Baths is a permanent balneoclimatic tourist resort of national interest located at an altitude of 635-650 m. It is located on the left bank of the Olt, at the contact of the Harghita Massif with the Bodoc Mountains, 32 km from Miercurea-Ciuc, 37 km from Sfântu Gheorghe, and 67 km from Braşov. The foundation of the resort dates to 1842. The climate was an intramontane depression. The average annual temperature is 6°C, and the prevailing winds blow from the northwest with low intensity. Average precipitation reached 600–700 mm. Natural healing factors (therapeutic) such as: bicarbonated,

carbonated, chlorinated, sodium, magnesium, ferruginous, calcium mineral waters, mesothermal waters, skunks, and bioclimate are used therapeutically for the treatment of various ailments, such as asthenic neurosis, cardiovascular ailments, and associated ailments (diseases of the digestive tract, endocrine, gynecological, renal and urinary tracts, and occupational diseases). The resort's tourist attractions are Lake Ciucaş (in winter, it serves as an ice rink and in summer as a cliff for the beach and water sports), Lake Sfânta Ana from the Ciomatu mountain, Tinovul Mohoş, or Lake cu muşchi, which covers an area of 80 ha and preserves rare species such as sky dew (carnivorous plant) and Falcon rock (848 m). (Neacsu et al., 2016).

The Borsec resort is a permanent balneoclimatic tourist resort of national interest. It is located in the depression of the same name between the Bistrita Mountains and those of Giurgeu Mountains, surrounded by peaks covered with fir forests, at an altitude of 800-900 m. The climate was cool with an intramontane depression. The average annual

temperature is 5°C. The relative humidity of the air has an annual average of 80%. Winds generally blow constantly and with greater intensity during the winter. The average annual precipitation has reached 800 mm. The natural therapeutic factors represented by the mineral waters (bicarbonate, carbonated), therapeutic peat mud, and stimulating mountain bioclimate contribute to the treatment of conditions such as cardiovascular diseases, endocrine diseases, digestive tract diseases, hepatobiliary diseases, asthenic neurosis, and associated diseases (renal and urinary diseases, respiratory, dermatological, metabolic and nutritional diseases, and occupational diseases). Tourist attractions of the resort are: Central Park, Poiana Zânelor and Round Hill with Travertine Quarry, Grotto of the Bears, Ice Cave, Citadel of Owls (where you can visit the ruins of a military fortification from the First World War), the "Paltinul pitic" botanical reserve. Along with the two balneo-climatic resorts, Harghita County also owns Praid, Jigodin Băi, and Harghita Băi spa resorts of local interest and the seasonal Homorod Baths spa resort (Neacsu et al., 2016).

By studying the dynamics of arrivals and overnight stays and analyzing the average length of stay in the two permanent spa resorts of national interest in Harghita County, Tușnad Baths and Borsec Resort, one of the fundamental needs of the tourist is answered - the definition of the tourist phenomenon. Tourist circulation represents, along with tourist potential and the material base, one of the components that participate in the definition of the tourist phenomenon. This best reflects the way and the level of capitalization of the tourist potential of an area, but the volume of tourist traffic is not always directly proportional to the value of the tourist heritage, because the stimulation of tourist traffic by promoting the visited objectives will also play an important role. (Aluculesei, 2015; Astefanoaiei et al., 2020; Erdeli et al., 2011; Simeanu et al., 2022; Simeanu et al., 2022).

MATERIAL AND METHOD

In number of tourists (arrivals) accommodated in touristy boarding units are included all the persons (Romanians and foreigners) who travel outside their own residence locality, for a period less than 12 months and who stay at least one night into a touristy boarding unit in areas which they visit

in the country; the main reason of the journey being other than to have a paid activity in the visited (statistici.insse.ro8077/tempo-online/).

Touristy overnight is a 24 hours period, starting with hotel hour, for which a person is recorded in the bookkeeping of touristy unit and it is hosted for the paid price, even if effective sojourn stay is lower than the mentioned period. Are also included the overnights afferent to supplementary installed beds (paid by customers) (statistici.insse.ro8077/tempo-online/).

Mean duration of sojourn is determined by rate between numbers of days/tourist (N_{ZT}) to tourists number (T) and reflects the possibility of touristy offer to retain a tourist into a certain area, region or country (Badita et al., 2005; Merce & Merce, 2009).

$$D_s = \frac{\sum N_{ZT}}{\sum NT}$$

where: D_s - mean duration of sojourn;

N_{ZT} - numbers of days/tourist;

T - tourists number.

Absolute indicators represent a basic form of dynamic series, based on which could be obtained general indicators (Badita et al., 2005; Merce & Merce, 2009; Petcu, 2005)).

Level indicators are the terms of a series formed by absolute indicators ($y \dots y_t \dots y_{t-1}$).

Total level of terms ($\sum_{t=1}^n y_t$), only for time interval series with absolute measures.

The absolute modifications: with fixed base $\Delta_{t/1} = y_t - y_1$ where, $t = \overline{2, n}$; with in chain base (mobile or variable base) $\Delta_{t/t-1} = y_t - y_{t-1}$ where, $t = \overline{2, n}$.

Relative indicators

It is a presentation way, mainly percentage. In this situation is mandatory that in title or outside the table to be mentioned the rating based so the data interpretation to be correctly done.

Dynamic index: with fixed base $I_{t/1(\%) } = \frac{y_t}{y_1} \times 100$;

with in chain base $I_{t/t-1(\%) } = \frac{y_t}{y_{t-1}} \times 100$.

Dynamic rhythm: with fixed base $R_{t/1} = I_{t/1(\%) } - 100\%$;

with in chain base $R_{t/t-1} = I_{t/t-1(\%) } - 100\%$, $t = \overline{2, n}$.

Average indicators: \bar{y} - the average level of the interval time series $\bar{y} = \frac{\sum_{t=1}^n y_t}{n}$, $\bar{\Delta}$ - the average level of the absolute change (increase or decrease) $\bar{\Delta} = \frac{y_n - y_1}{n-1}$, \bar{i} - the average index of

dynamics $\bar{I} = \frac{1}{n} \sum_{t=1}^n \sqrt[n]{I_t}$, \bar{R} - the average growth rate
 $\bar{R} = \bar{I} - 100$.

To adjust the number of tourists, the method of trends adjusted according to the polynomial trend, for the time period 2012-2026 was used:

Polynomial model: $y = a + bt$.

R is the correlation between the values predicted by the equation and the current values. The square R is used to indicate the variation of the values from the trend line (Pantiru, 2006).

RESULTS AND DISCUSSIONS

Analysis of tourist demand

Using the statistical data provided by the National Institute of Statistics (statistici.insse.ro8077/tempo-online/), regarding the tourist demand from the Borsec and Tuşnad Baths tourist resorts in Harghita County, we can analyze the level and dynamics of the following indicators: the level of total arrivals; the level of total overnight stays and the average length of stay. These indicators are characterized in terms of both dynamics and structure.

The level and dynamics of arrivals and overnight stays

Analyzing the absolute and relative dynamics of arrivals in the period 2012-2021 (Table 1), in the balneo-climatic resort Borsec,

an important increase was registered in 2021, of 168.63%, compared to the base year (2012). The largest increase in the number of arrivals compared with the base year was recorded in 2018 at 273.14%. Compared to the previous year, the largest increase in the number of arrivals was recorded in 2016, at 70.34%, and a significant decrease in the number of arrivals compared to the previous year was recorded in 2020 (pandemic year), at 42.53%. Overall, the average number of arrivals registered 6,024.2, with an absolute average increase of 491.11, and a relative increase of 11.6%. In the Tuşnad Baths resort, it was found that the number of people arriving increased by 114.81% in 2021 compared to the base year (2012), and the highest increase in arrivals compared to the base year was recorded in 2017, at 191.36%. Compared to the previous year, the largest increase in arrivals was recorded in 2021, at 76.83%, and a significant decrease in the number of arrivals compared to the previous year was also recorded in 2020 (pandemic year), at 57.67%. Overall, the average level of arrivals in the Tuşnad Baths resort recorded 30,171.8 people, with an average absolute increase of 1,887.33 people and a relative increase of 8.8%. A comparison of the average level of arrivals from the two spa resorts shows that in Tuşnad Baths their number is approximately 5 times higher than the average level of arrivals from the Borsec resort, due to the much larger accommodation capacity of the Tuşnad Baths resort.

Table 1

Absolute and relative changes in arrivals from Borsec spa resorts and Tuşnad Baths (Harghita County) during the period 2012-2021

Borsec							
Years	Arrivals (number of people)	Absolute changes		Dynamics index %		The rhythm of dynamics %	
		$\Delta t/1$	$\Delta t/t-1$	$I_t/1$	$I_t/t-1$	$R_t/1$	$R_t/t-1$
2012	2,621	-	-	-	-	-	-
2013	3,292	671	671	125.6	125.6	25.6	25,6
2014	3,800	1,179	508	144.98	115.43	44.98	15.43
2015	4,990	2,369	1,190	190.38	131.31	90.38	31.31
2016	8,500	5,879	3,510	324.3	170.34	224.3	70.34
2017	8,694	6,073	194	331.7	102.28	231.7	2.28
2018	9,780	7,159	1,086	373.14	112.49	273.14	12.49
2019	7,318	4,697	-2,462	279.2	74.82	179.2	-25.18
2020	4,206	1,585	-3,112	160.47	57.47	60.47	-42.53
2021	7,041	4,420	2,835	268.63	167.4	168.63	67.4
	\bar{y}	$\bar{\Delta}$		\bar{I}		\bar{R}	
	6,024,2	491,11		1.116 (111,6%)		11.6	
Tuşnad Baths							
Years	Arrivals (number of people)	Absolute changes		Dynamics index %		The rhythm of dynamics %	
		$\Delta t/1$	$\Delta t/t-1$	$I_t/1$	$I_t/t-1$	$R_t/1$	$R_t/t-1$

2012	14,794	-	-	-	-	-	-
2013	18,316	3,522	3,522	123.8	123.8	23.8	23.8
2014	23,285	8,491	4,969	157.39	127.12	57.39	27.12
2015	31,260	16,466	7,975	211.3	134.24	111.3	34.24
2016	37,610	22,816	6,350	254.22	120.31	154.22	20.31
2017	43,104	28,310	5,494	291.36	114.6	191.36	14.6
2018	41,146	26,352	-1,958	278.12	95.45	178.12	-4.55
2019	42,451	27,657	1,305	286.94	103.17	186.94	3.17
2020	17,972	3,178	-24,479	121.48	42.33	21.48	-57.67
2021	31,780	16,986	13,808	214.81	179.83	114.81	76.83
	\bar{Y}	\bar{X}		\bar{I}		\bar{R}	
	30,171.8	1,887.33		1.088 (108.8%)		8.8	

Source: calculation according to insse.ro

To estimate the number of tourists arriving in the next five years (2022-2026) the adjustment function for the Borsec resort was used, $y = -50.671x^2 + 204969x - 2E+08$ and for the Tuşnad Baths resort, the adjustment function: $y = -$

$248.59x^2 + 1E+06x - 1E+09$, obtained by the graphic method according to the polynomial trend. The R square was used to indicate the variation of the values compared to the trend line: for the Borsec resort: $R^2 = 0.5855$, and for Tuşnad Baths: $R^2 = 0.4784$ (Figure 1).

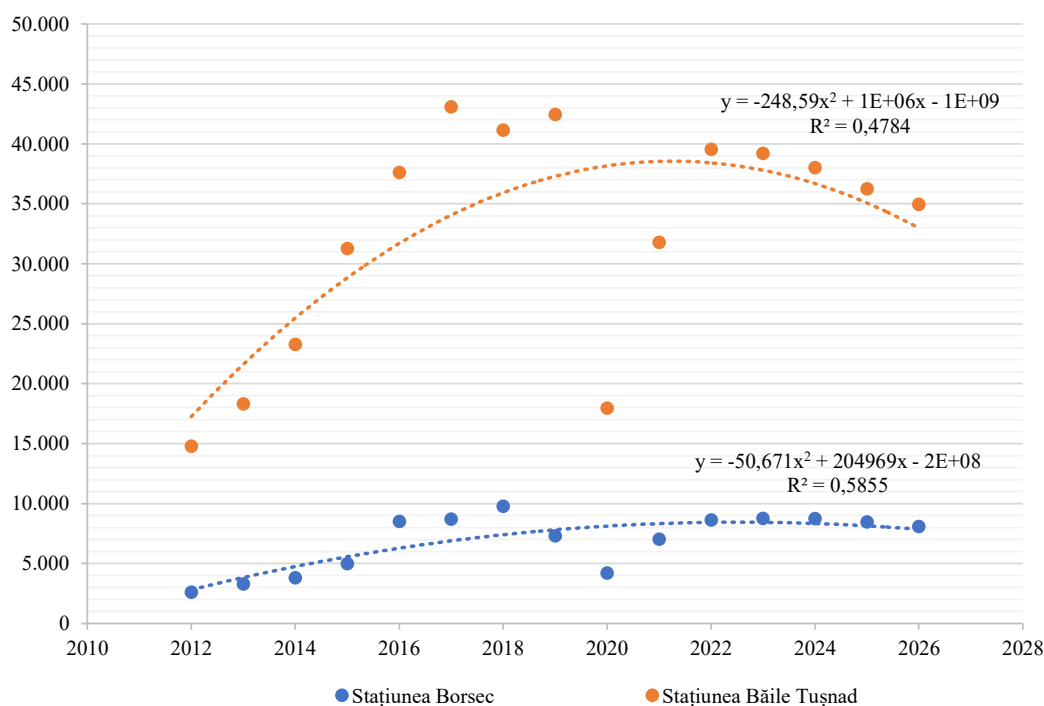


Figure 1 Dynamics and estimation of arrivals in the period 2012-2026 in balneoclimatic resorts Borsec and Tuşnad Baths (Harghita county)

Given that the influencing factors in the tourist activity will maintain the same pace in the next five years of the analyzed period (table 2), in 2026 the number of tourists arriving in the resort

of Borsec will be approximately 8 thousand, and in the resort of Tuşnad Baths there will be of approximately 35 thousand.

Table 2

Estimation of arrivals in the period 2022 - 2026, in the Borsec spa resorts and Tuşnad Baths (Harghita county)

Years	T(x)	Arrivals (no. arrivals)	
		Borsec $y=359,33x-718633$	Tuşnad Baths $y=1122,3x-2000000$
2022	11	8,635.26	39,553.4
2023	12	8,772.17	39,205.29
2024	13	8,741.82	38,006.51
2025	14	8,469.45	36,260.67
2026	15	8,076.02	34,961.73

Analyzing the absolute and relative dynamics of overnight stays in the period 2012-2021 (table 3), in the balneo-climatic resort of Borsec, it was found that their number increased by 83.55% in 2021,

compared to the base year (2012). The largest increase in the number of overnight stays compared with the base year was recorded in 2017 at 205.39%.

Table 3

Absolute and relative changes in overnight stays, from the spa resorts Borsec and Tuşnad Baths (Harghita county), in the period 2012-2021

Borsec							
Years	Overnight stays (number of overnight stays)	Absolute changes		Dynamics index %		The rhythm of dynamics %	
		$\Delta t/1$	$\Delta t/t-1$	$I_t/1$	$I_t/t-1$	$R_t/1$	$R_t/t-1$
2012	6,839	-	-	-	-	-	-
2013	6,808	-31	-31	99.54	99.54	-0.46	-0.46
2014	7,243	404	435	105.9	106.38	5.9	6.38
2015	14,331	7,492	7,088	209.54	197.86	109.54	97.86
2016	17,017	10,178	2,686	248.82	118.74	148.82	18.74
2017	20,886	14,047	3,869	305.39	122.73	205.39	22.73
2018	20,842	14,003	-44	304.75	99.78	204.75	-0.22
2019	16,764	9,925	-4,078	245.12	80.43	145.12	-19.57
2020	8,612	1,773	-8,152	125.92	51.37	25.92	-48.63
2021	12,553	5,714	3,941	183.55	145.76	83.55	45.76
	\bar{Y}	Δ		I		R	
	13,189.5	634.88		1.069 (106.9%)		6.9	
Tuşnad Baths							
Years	Overnight stays (number of overnight stays)	Absolute changes		Dynamics index %		The rhythm of dynamics %	
		$\Delta t/1$	$\Delta t/t-1$	$I_t/1$	$I_t/t-1$	$R_t/1$	$R_t/t-1$
2012	118,522	-	-	-	-	-	-
2013	119,550	1,082	1,082	100.86	100.86	0.86	0.86
2014	122,670	4,148	3,120	103.49	102.6	3.49	2.6
2015	140,422	21,900	17,752	118.47	114.47	18.47	14.47
2016	168,199	49,677	27,777	141.91	119.78	41.91	19.78
2017	154,043	35,521	-14,156	129.96	91.58	29.96	-8.42
2018	130,630	12,108	-23,413	110.21	84.8	10.21	-15.2
2019	130,477	11,955	-153	110.08	99.88	10.08	-0.12
2020	46,380	-72,142	-84,097	39.13	35.54	-60.87	-64.46
2021	94,540	-23,982	48,160	79.76	203.83	-20.24	103.83
	\bar{Y}	Δ		I		R	
	122,543.3	-2,664.66		0.975 (97.5%)		-2.5	

Source: calculation according to insse.ro

Compared to the previous year, the largest increase in the number of overnight stays was recorded in 2015 (97.86%), and the most significant decrease in the number of overnight stays compared to the

previous year was recorded in 2020 (48.63%). The decrease in the number of overnight stays was due to the pandemic.

Overall, the average level of overnight stays was 13,189.5 nights, with

an absolute average increase of 634.88 nights and a relative increase of 6.9%.

In the Tuşnad Baths resort, it was found that the number of overnight stays decreased by 20.24% in 2021 compared to the base year. The largest increase compared to the base year was recorded in 2016, by 41.91%, but an important decrease in the number of overnight stays was recorded in 2020 (pandemic year), by 60.87% compared to the base year.

Compared to the previous year, the largest increase in the number of overnight stays was recorded in 2021 (103.83%), and the most significant decrease compared to the previous year was recorded in 2020 (64.46 %).

Overall, the average number of

overnight stays was 122,543.3 nights, with an absolute average decrease of 2,664.66 nights and a relative decrease of 2.5%.

To estimate the number of overnight stays of tourists in the next five years (2022-2026) in the Borsec resort, we used the adjustment function $y = -129.84x^2 + 524837x - 5E+08$ and for the Tuşnad Baths resort, the adjustment function: $y = -766x^2 + 3E+06x - 3E+09$, obtained by the graphic method according to the polynomial trend (figures 2). The R square was used to indicate the variation of the values compared to the trend line: for the Borsec resort: $R^2 = 0.4455$, and for the Tuşnad Baths resort: $R^2 = 0.66$.

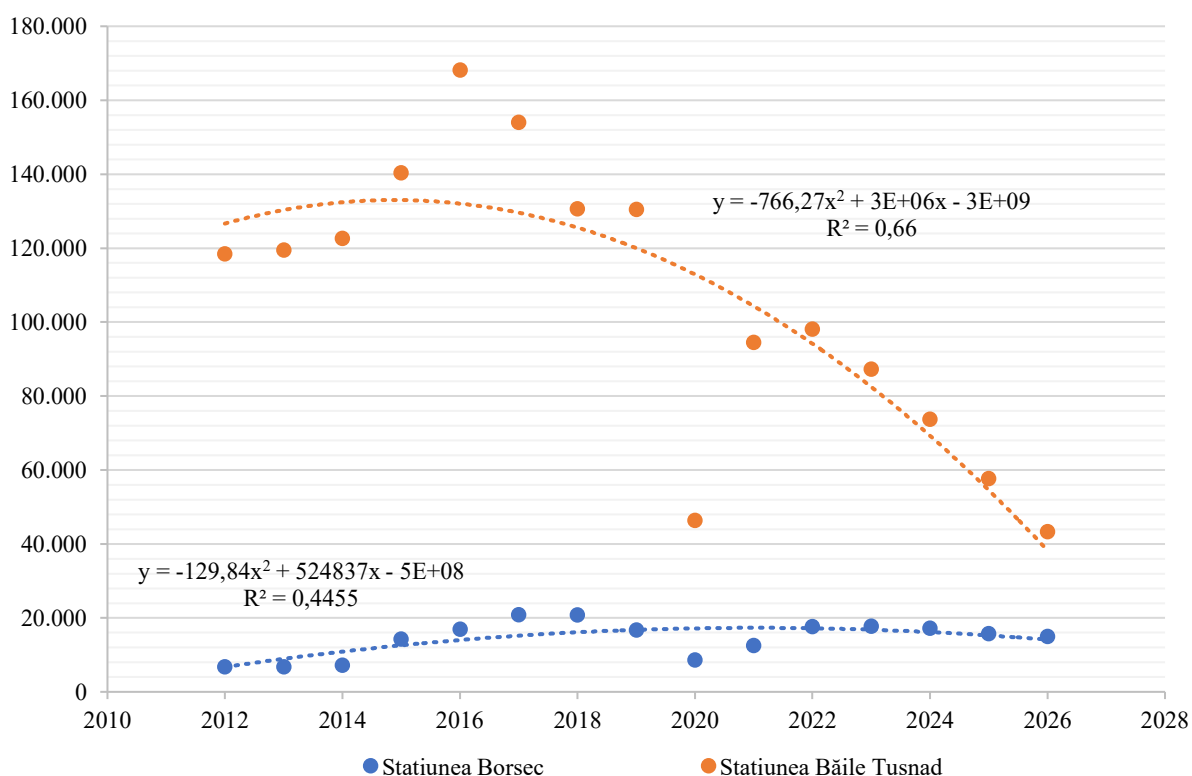


Figure 2. Dynamics and estimation of overnight stays in the period 2012-2026 in spa resorts Borsec and Tuşnad Baths (Harghita county)

In the conditions in which the influencing factors in the tourist activity will maintain the same pace in the next five years of the analyzed period (table 4), in the year 2026 in the resort of Borsec, the number of overnight stays will be approximately 15 thousand, and in the resort of Tuşnad Baths there will be of approximately 43.4 thousand.

The average length of stay as an indicator that shows the average time (days) tourists stay in the accommodation

spaces and thus reflects the possibility of the offer to retain the tourist in a certain area or region (Turcu & Weisz, 2008), in the analyzed period (2012-2021), (Table 5) for the Borsec resort, the highest value of the average length of stay was recorded in 2015, of 2.87 days, and the lowest value was recorded in 2021, 1.78 days. At the end of the analyzed period (2021), a 31.54% decrease in the average length of stay compared to the base year (2012) was observed.

Table 4

**Estimation of overnight stays in the period 2022 – 2026, in the spa resorts
Borsec and Tuşnad Baths (Harghita county)**

Years	T(x)	Overnight stays (number of overnight stays)	
		Borsec $y=528,32x-1000000$	Tuşnad Baths $y=-6311,3x+1000000$
2022	11	17,691.53	98,125.8
2023	12	17,798.88	87,286.45
2024	13	17,217.39	73,745.24
2025	14	15,786.59	57,770.46
2026	15	15,008.64	43,401.28

In the Tuşnad Baths resort, the highest average length of stay was recorded in 2012, 8.01 days, and the lowest value (2.58 days, was recorded in 2020. The low length in 2020 was due to the pandemic, the year in which the movement of tourists

was limited. The decrease in the average length of stay at the end of the analyzed period (2021) for Tuşnad Baths was much more obvious, by 62.92%, compared to the base year (2012).

Table 5

**The average length of stay, in the period 2012-2021, in the Borsec spa resorts
and Tuşnad Baths (Harghita county)**

Years	Overnight stays (number of overnight stays)		Arrivals (no. arrivals)		Average length of stay (days)	
	Borsec	Tuşnad Baths	Borsec	Tuşnad Baths	Borsec	Tuşnad Baths
2012	6.839	118.522	2.621	14.794	2,60	8,01
2013	6.808	119.550	3.292	18.316	2,06	6,52
2014	7.243	122.670	3.800	23.285	1,90	5,26
2015	14.331	140.422	4.990	31.260	2,87	4,49
2016	17.017	168.199	8.500	37.610	2,00	4,47
2017	20.886	154.043	8.694	43.104	2,40	3,57
2018	20.842	130.630	9.780	41.146	2,13	3,17
2019	16.764	130.477	7.318	42.451	2,29	3,07
2020	8.612	46.380	4.206	17.972	2,04	2,58
2021	12.553	94.540	7.041	31.780	1,78	2,97

Source: calculation according to insse.ro

Opening at the end of 2022, in the center of the Borsec balneo-climatic resort of the Fontana Spa & Balneo Center (with a capacity of 1,000 people/day in the summer season and 700 people/day in the winter), the largest spa and balneo center in Romania can offer tourists real possibilities to extend the average length of stay for the treatment of various ailments but also to enjoy a special natural setting offered by the area. The Tuşnad Baths resort compared to the Borsec resort has the advantage of the existence within it of tourist reception structures with a much larger accommodation capacity (hotels, classified between 4 and 2 stars) and a treatment base within the Tuşnad Hotel with a very large capacity good, of 900 patients/day.

CONCLUSIONS

Analyzing the absolute and relative dynamics of arrivals in the analyzed period (2012-2021), in the resort of Borsec, it could be observed that their number increased significantly in 2020 compared to 2011 by approximately 170%; overall, the average level of arrivals recorded 6 thousand people, with an average absolute increase of 491.1 people and a relative increase of 11.6%. This growth can be caused by the economic growth of the area, implicitly determining the high interest of tourists in balneoclimatic tourism in this area. Researching the absolute and relative dynamics of arrivals from the same period of time (2012-2021), in the Tuşnad Baths resort, it could be observed that compared to the base year, the number of tourists also increased a lot in 2021, by 114.8% compared to of the base year. In total, the average level of arrivals in the Tuşnad

Baths resort recorded 30.1 thousand people, with an average absolute increase of 1.88 thousand people and a relative increase of 8.8%.

Analyzing the absolute and relative dynamics of overnight stays in the period 2012-2021, in the resort of Borsec it could be observed that their number also increased in 2021 compared to 2012 by 83.55%. Overall, the average level recorded 13.18 thousand overnight stays, with an absolute average increase of 634.88 overnight stays and a relative increase of 6.9%. Researching the absolute and relative dynamics of overnight stays in the same period of time (2012-2021), in the Tuşnad Baths resort, it could be seen that their number decreased in 2021 compared to 2012 by 20.24%. Overall, the average level registered 122.54 thousand overnight stays, with an absolute average decrease of 2.66 thousand overnight stays and a relative decrease of 2.5%.

Given that the influencing factors in tourism activity will maintain the same pace in the next five years, in the year 2026 in the resort of Borsec the number of tourists arriving

will be approximately 8 thousand and the number of overnight stays will be approximately 15 thousand and in the resort of Tuşnad Baths the number of tourists arriving will be approximately 35 thousand and the number of overnight stays will be approximately 43.4 thousand.

The average length of stay for the resort of Borsec, recorded in the analyzed period (2012-2021) a decrease of 31.54%, while in the resort of Tuşnad Baths the average length of stay recorded at the end of the analyzed period (2021) compared to the year of base (2012) a significant decrease of approximately 63%. The decrease in the average length of stay in the two resorts in Harghita County during the analyzed period (2012-2021), indicates a decrease in the purchasing power of customers for the tourist services offered, probably also the practice of too high rates inconsistent with the services offered and given that 2020 was a difficult year for tourism due to the Covid 19 pandemic.

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