

ANALYSIS OF THE SOCIAL AND ECONOMIC ROLE OF SPAS- A TIME SERIES ANALYSIS OF THE TURNOVER DATA OF HUNGARIAN BATHS IN THE LIGHT OF COVID

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Abstract

In this technical article, we deal with the role of Hungarian baths in tourism and recreation. In the grouping of baths, we analyzed their turnover (number of visitors) and financial indicators (specific sales revenue) based on the nature of their operation (independently or associated with accommodation services, or as part of another institution). We used a time series analysis to examine the development of the water surface of the baths, the data of the baths in Budapest and the Zala county between 2014-2022, in order to get an idea of the change in turnover data caused by Covid. We analyzed the time series data by breaking down income from accommodation, spas and medical services. We studied the development of the number of guests and sales revenue of the baths using regression calculations.

The analysis yielded the interesting result that although the largest income per guest was produced by baths with major accommodation services or wellness hotels, the reason for this is not only the ticket sales, but also the investment support sources of the tender funds. Independently operating baths realize a relatively low level of per capita sales, their operation is still important, as these baths satisfy the recreational needs of the local population, since baths are no longer only part of the annual vacation, but also the scene of well-being and reproduction of work ability, which is also intended to serve the quality of life of the local population.

1 Introduction

The culture and role of baths have continuously evolved and developed throughout human history, and their significance remains prominent today. In ancient times, particularly during the Roman civilization, baths were centers of social life where people not only bathed but also relaxed, entertained, and engaged in community life. The example of Roman thermal baths shows that water and baths have been sources of health and well-being for millennia.

In modern times, baths also play an important role, particularly in the areas of recreation, health maintenance, and health tourism [6,10,12]. Due to the stressful and fast-paced lifestyle, there is an increasing need for places where people can recharge and regain their physical and mental balance[5]. The services offered by baths – such as thermal waters, therapeutic pools, saunas,

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massages, and other wellness treatments – all contribute to relaxation, rejuvenation, and health maintenance [2].

Due to the special composition of thermal waters, many baths also function as medical centers specializing in the treatment of various musculoskeletal, rheumatic, and other diseases[6]. These medicinal baths are popular not only among the local population but also among foreign tourists, contributing to the development of health tourism. In the context of health tourism, people come not only to relax and heal but often also to take advantage of comprehensive health services, combining pleasant leisure activities with medical care [3, 4, 7].

Overall, the significance of baths is multifaceted: they are important as recreation centers, medical facilities, and tourist destinations [1, 2, 3]. The healing power of water and the combination of modern wellness services offer unique opportunities for health maintenance and achieving physical and mental harmony. Hungary is rich in thermal and medicinal waters, which are the cornerstones of the country's health tourism. Domestic baths are popular not only among local visitors but also attract international tourists. Health tourism is one of the most dynamically growing sectors in the country, generating significant economic revenue and creating jobs.

The health tourism role of domestic baths brings substantial economic benefits [1]. Health tourism contributes to the economic development of rural areas, creates jobs, and stimulates local businesses. The spending of tourists not only increases the revenue of baths but also boosts the demand for local accommodations, catering establishments, and other services. Therefore, baths are indispensable resources for the country's economic and social development.

The purpose of this research is to analyze the social and economic roles of Hungarian spas and baths, particularly in the context of the COVID-19 pandemic. The study employs a time series analysis of turnover data from 2014 to 2022, examining visitor numbers and financial performance across different types of baths—those operating independently, those associated with accommodation services, and those part of other institutions. By breaking down income from accommodation, spa, and medical services, the research aims to understand how these facilities contribute to local recreation and health tourism, and how their operation and profitability have been influenced by the pandemic. The findings highlight the economic importance of baths, especially those with accommodation services, while also emphasizing the critical role of independent baths in supporting local communities' recreational and health needs.

2 Methods

In 2022, around 1,000 baths were registered with the National Public Health Centre. Of these, more than 500 have no operational data, are reported to be either closed or not operating for some reason (Hungarian Central Statistical Office (HCSO), Report on the turnover of baths, questionnaire 1054). A quarter have closed or are in liquidation. The analysis can be carried out on the number of entries (433).

The database used for the research was the HCSO database, based on the questionnaire Report on the Turnover of Baths, 1054, while the register data on baths was provided by the National Public Health Centre register (Data transfer report Questionnaire no. 2313, List of baths) for the HCSO. From the data collection, a long time series file (2014-2023) was available. In the frequency statement, no fewer than 5 units could be placed in a compartment to ensure data protection. The aim of the analysis was to investigate correlations that could reveal factors that may influence the use and profitability of baths.

As the data collection covers the entire population of bath operators, a descriptive statistical method was used. A time series analysis was carried out on the water surface, capacity, number of passenger and turnover of the baths.

Baths can be classified in several ways on the basis of the annual report. Firstly, according to the nature of the bath (permanent or seasonal), or according to the autonomy of the bath, i.e. whether it is a stand-alone bath, has accommodation or is part of another establishment [16]. There

are also classifications by type, such as spa, thermal bath, adventure bath, beach, etc. The National Health Tourism Development Strategy 2007 has defined three categories:

- Bathing areas of international importance, historic and monumental baths, spas
- Tourism service providers of national and regional importance
- Baths of local importance

The ESPA (European Spa Association) certifies spas in European countries. They list the member spas of the countries that must meet a set of quality criteria for inclusion. These spas are then given the opportunity to be recognised as "priority" spas in Hungary. ESPA has 10 Hungarian members, and there are also 5 ESPA MED and 1 ESPA Thermal Spa award-winning establishment [10].

The classification of our present research was based on whether a bath is independent or not, so we want to investigate how much the number of guest and revenue is if it is independent, and how it is for non-independent baths. Whether they operate individually or in conjunction with other establishments or accommodation establishments influences their operation and profitability.

Methodologically, a specific indicator was calculated, which is the value of the revenue per guest based on the data for 2022. A frequency plot (histogram) was applied to this specific indicator, showing the number of occurrences in each interval. On this basis, additional statistical values such as mean, median, standard deviation, minimum and maximum have been calculated for this indicator.

Finally, a regression analysis was performed for the two main indicators (turnover, number of guest) for the different groups, i.e. those operating independently, in association with a tourist accommodation or other establishment. The coefficient of determination is r^2 , with a value between 0 and 1, including the bounds. It indicates the proportion of the total variance of the dependent variable explained by the independent variables squared. The bounds of the odds ratios are defined as follows:

- 0.00 to 0.40 for a loose relationship or no relationship,
- between 0.41 and 0.70 for a medium relationship,
- between 0.71 to 0.90 for a close relationship,
- between 0.91 and 1.0, a very close relationship (functional at 1).

3 Results and discussion

3.1. Capacity of baths

Various services are available at the baths, not only wellness but also commercial services. The graph below shows how many baths in 2022 (among those in operation) have indicated that they offer the following main services. Of course, a bath could indicate more than one service (HCSO, Baths turnover report, Filling guide) (Figure 1)

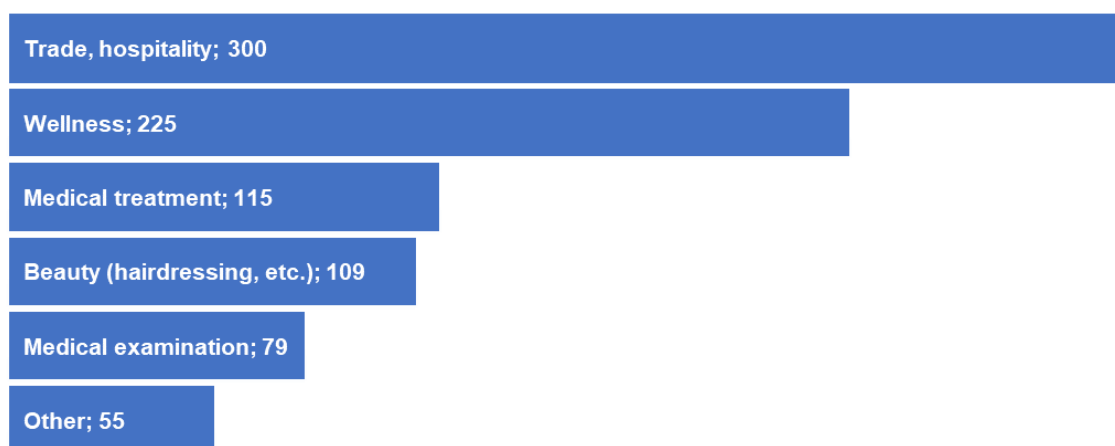


Figure 1. Baths where the following services are available 2022
Source: HCSO database, 2022

The data collection shows that commercial or catering facilities are available at most of the bathing areas. These are mainly buffets, eating places or small shops selling, for example, swimwear or souvenirs. A quarter of baths offer wellness services, such as thermal water, massages or jacuzzi. Therapeutic treatments are available in one in ten baths, which specifically refers to medically supported services. In addition, many also offer beauty services (hairdressing, cosmetics) or medical examinations.

The capital and four counties will account for half of the baths' water surface in 2022, Zala, Szabolcs-Szatmár-Bereg, Hajdú-Bihar and Pest, with more than 30 000 m² (Figure 2).

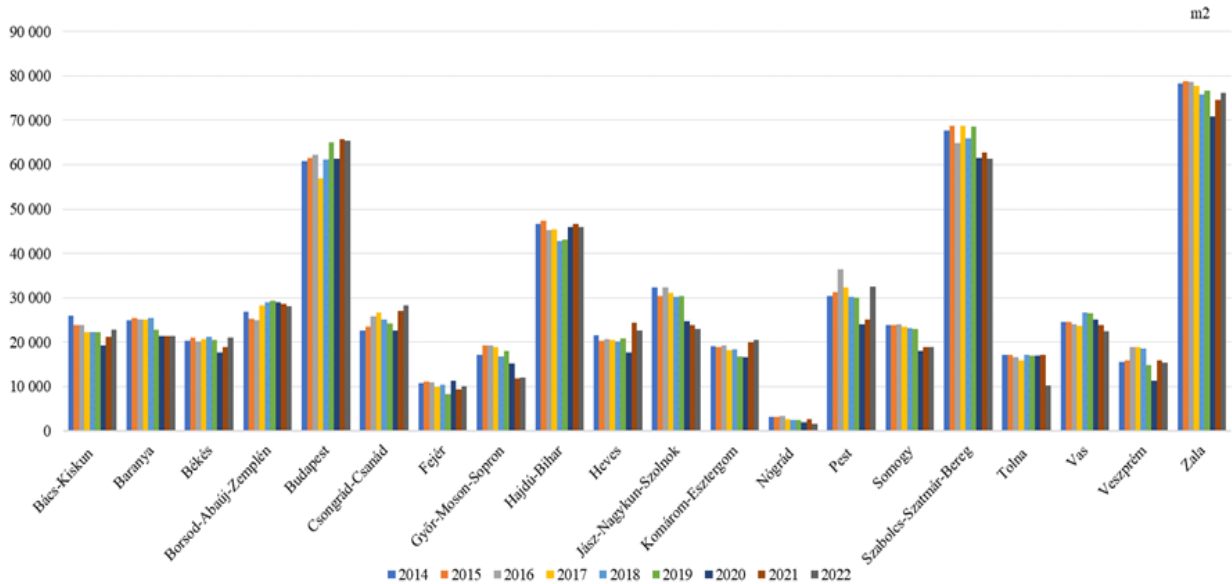


Figure 2. Surface area of baths by county 2014-2022
Source: HCSO database, 2022

Due to the Covid effect, the water surface area and the number of baths decreased slightly in 2020, but it is expected that the temporarily closed units will reopen later. In 2022, the average water surface area per bath was the largest in Szabolcs-Szatmár-Bereg (3403), followed by Zala with 2540 m²/bath and Hajdú-Bihar with 1913 m²/bath.

Although Zala county has more water surface area, Budapest has the highest number of baths. Therefore, the figure below shows the bath numbers of these two areas (Figure 3).

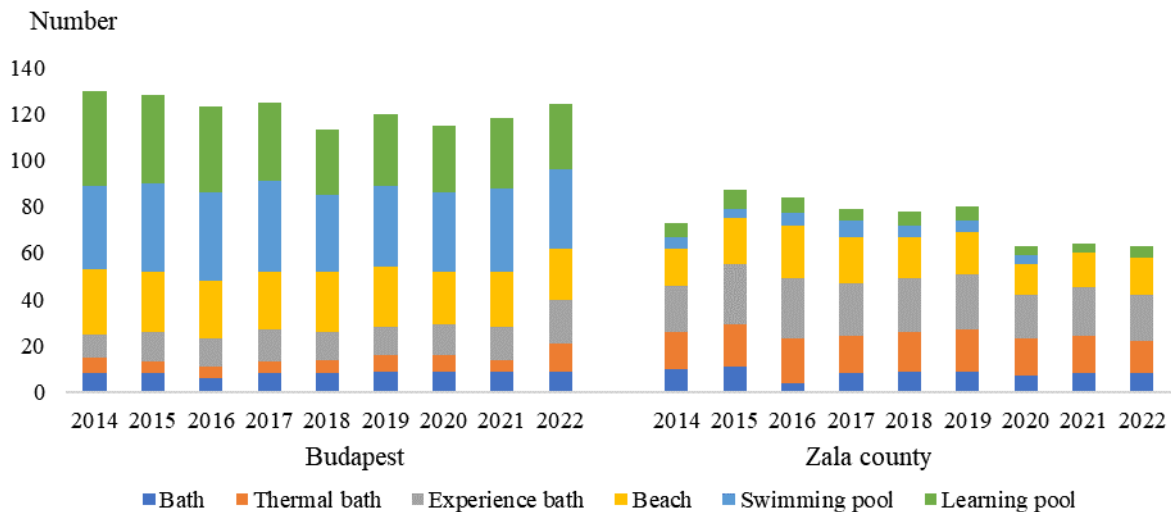


Figure 3. Number of baths by type in Budapest and Zala county*2014-2022

* A bath can be classified in more than one type.
Source: HCSO database, 2022

In Budapest, there was no significant break in capacity due to the pandemic, and the number of baths and thermal baths increased following the epidemic. Between 2012 and 2015, several baths underwent upgrades, including Dandar Bath, Rudas and Lukács Bath.

"In the 2014-2020 programming period, the baths did not receive funding for their development, only complex bath development was possible, which mainly resulted in infrastructure development of the bath resort". "Building on Hungary's existing product portfolio, the priority is to widely communicate the value and develop the attractiveness of baths. Consequently, cultural and active tourism attractions, complementary services and the upgrading of baths with international appeal could be the most important break-out point for Hungary - and for individual destinations." [10].

The range of popular sports services should be expanded, popular programmes should be organised more frequently, and new series of events with similar programming should be launched. The satisfaction of visitors who want to do sports could be increased, e.g. by creating outdoor fitness parks [1, 2, 4].

Bath developments in recent years include the Ellipsium Experience Bath in Miskolctapolca, the Mezőcsát Bath or the Premium Zone at Hungarospa. Other significant investments include the Cegléd Bath and the Flora thermal bath in Kapuvár. Other developments include the renovation of the Győr, Szolnok, Berettyóújfalú and Sáropataks baths. The reconstruction of the Lepence beach is also expected, but no target date has been set yet.

In 2024, Sárvár's newest five-star hotel opened with a holistic concept. The health-focused Melea The Health Concept hotel will be designed with sustainability and climate protection in mind, with heating provided entirely by a geothermal heat pump. Guests are provided with a health questionnaire, laboratory tests, an internist, personal trainer, dietician and beauty specialist, as well as a personalised programme and diet.

3.2. Visitor flows to the baths

The Hungarian spa towns play a prominent role in the country's domestic and international tourism, not only in terms of their historical past, but also in terms of their current performance and their expected future positions based on trends [12].

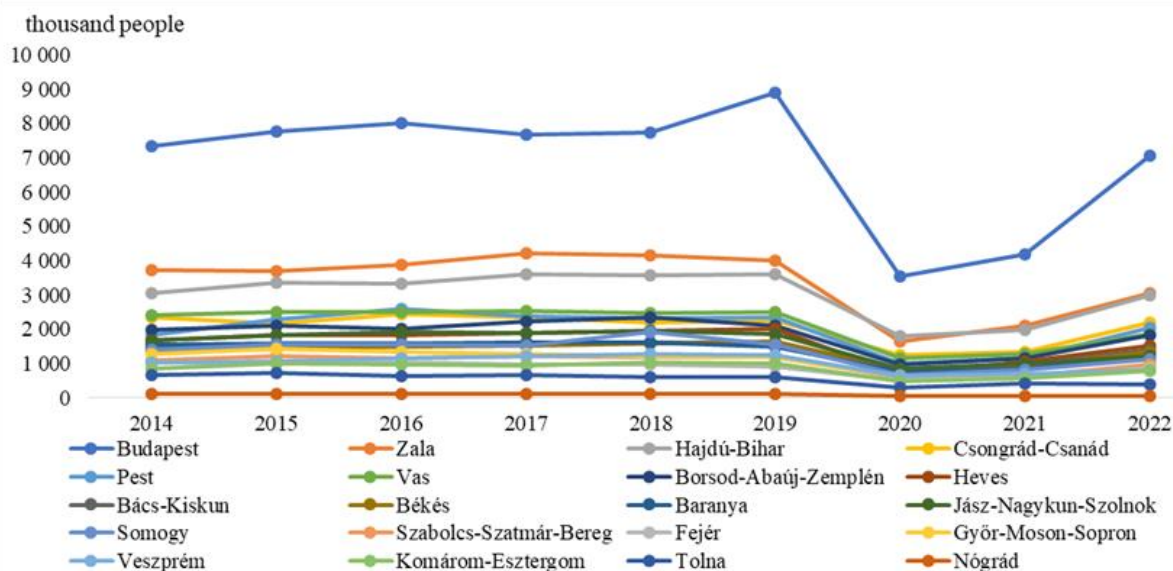


Figure 4. Number of guests in baths by county 2014-2022
Source: HCSO database, 2022

In the last decade, the number of visitors to baths has steadily increased, reaching almost 9 million in Budapest in 2019, 4 million in Zala county and 3.6 million in Hajdú-Bihar (Figure 4). In

2019, the number of visitors exceeded 44 million nationwide, but then in 2020, the COVID19 virus crisis forced many baths to close. Visitor numbers halved (21 million). The crisis has had a significant impact on the turnover of baths, with visitor numbers in the capital falling to 3.5 million and the other counties halving their numbers. With the end of the pandemic, hope and confidence began to return, and by 2022 the country's annual number of visitors to the bathing sector had reached 35 million, only a fifth less than the 2019 base figure. Csongrád-Csanád county has already recorded a 98% increase in visitor numbers, and Fejér has seen 97% of its visitors return.

Similar trends were also observed in Romania. "It is noteworthy that while tourist arrivals in the high season and summer months have returned to normal from 2021, there does not seem to have been a significant increase in the following years compared to 2021, indicating that the effects of the epidemic were still being felt." "In 2023, Romania has not yet reached its pre-pandemic tourism demand levels, certainly raising important questions for tourism stakeholders, especially as these low figures can again be explained by the increasing attractiveness of external destinations for Romanians in recent years, such as Turkey, Greece or neighbouring Bulgaria" [18].

3.3. Revenue of baths

The revenue of baths shows a steady increase in parallel with the flow of guests until the end of the decade. In 2014, the revenue amounted to USD 545 million, then it increased continuously and reached USD 630 million in 2019 (Figure 5). However, the 2020 pandemic halved revenue due to the lack of visitors, so it fell to USD 302 billion. Not only did the turnover decrease, but the ratio of the factors generating sales also changed. The proportion of revenues from medical and spa services decreased compared to the 2019 base (7-5%, 32-31%), but the proportion of accommodation sales revenues increased (from 38 to 44%).

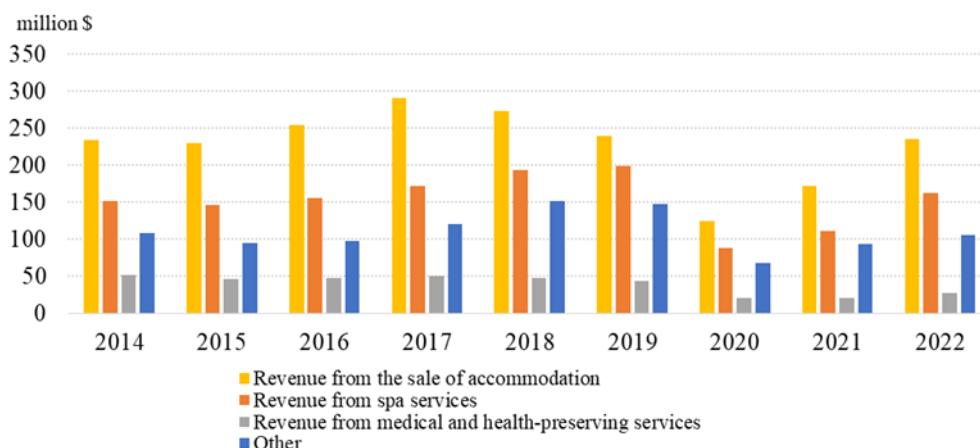


Figure 5. Elements of revenues of baths*
Source: HCSO database, 2022

As it could be seen from the flow of guests, the guests who wanted to take a bath returned, and by 2022 the increase in revenues was already noticeable. On a national level, baths brought in USD 530 million in revenue, which is considered a record level, because such a level of revenue has not yet been booked for this sector. It must be noted here that in 2022, after the outbreak of the Russian-Ukrainian war, the general price level increased significantly, which also contributed to the increase in income.

The main driver of the revenue was the accommodation part, which also set a record in the amount of USD 236 billion, just as the revenue from spa services also indicated a record amount of USD 163 billion. Baths with accommodation revenue are those that, according to their statement, do not work independently, but together with accommodation. Here, the pulling power of the accommodation sector had an effect on the bath units in the accommodation. The possibility of paying with the Széchenyi card also encourages visitors to take advantage of the facilities offered by the baths, in 2022 HUF 50 million were already paid with it. Medical and health care services

were used by fewer people and to a lesser extent after the COVID19 epidemic, and the baths reported sales revenue of USD 27 billion.

The following Figure 6 shows the revenue of baths calculated per bath visitor, broken down by county. The capital is to be treated as a separate unit.

$$\text{Specific revenue of baths} = \frac{\text{Revenue}}{\text{Number of guests}}$$

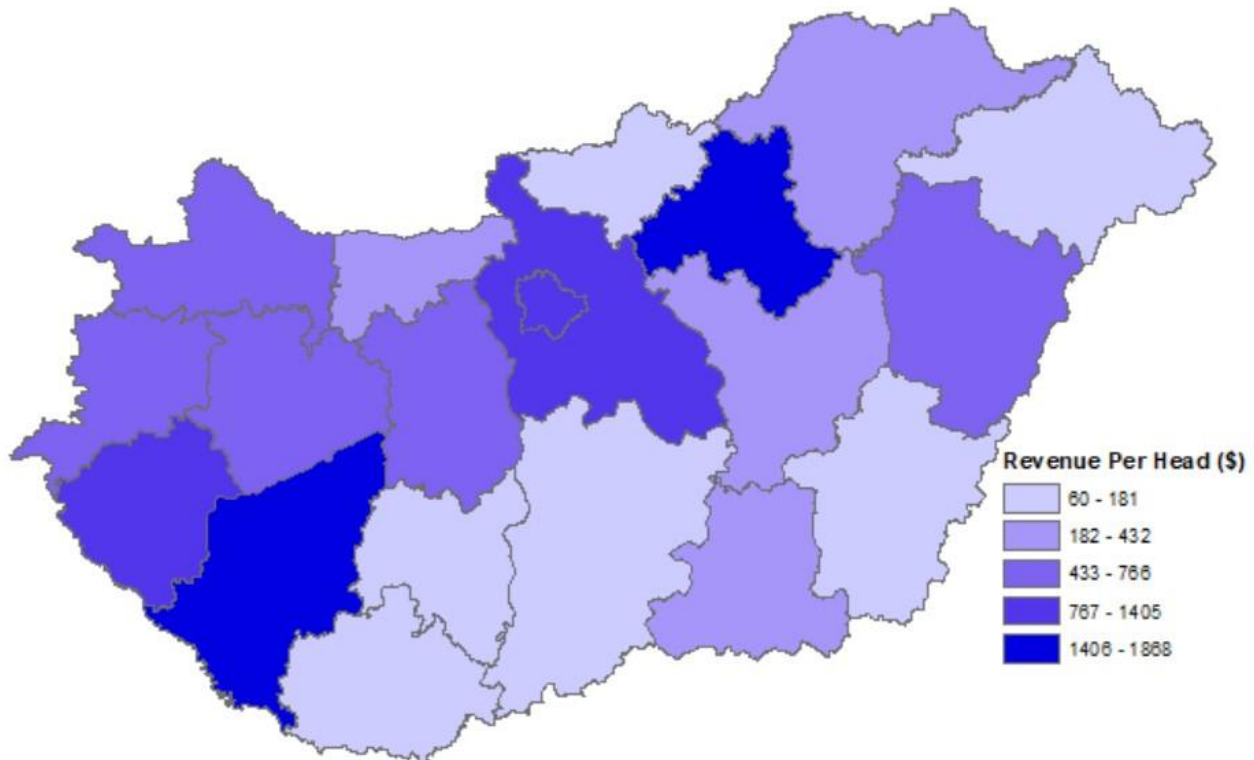


Figure 6. Per capita revenue of baths by county (\$) 2022

Source: HCSO database, 2022

The map shown in figure 6 shows the specific sales revenue (per capita) of spas in Hungarian counties. The highest per capita sales can be measured in the counties of Heves, Somogy, Zala, Pest and Budapest. The reason behind this is the higher sales revenue in most counties, although in theory the high value of the specific indicator may also indicate lower guest turnover.

3.4. The autonomy of baths

Domestic baths have an annual obligation to provide data CLV 2016. Act on official statistics based on a decree (OSAP 1054), which is sent electronically to the Hungarian Central Statistical Office. Among the main characteristics of baths is the question of the bath' independence, according to which the bath can be classified into the following types:

- the bath operates independently (1),
- the bath does not operate independently, but together with an accommodation (2),
- the bath does not operate independently, but as part of another institution (3)

Independence has a significant impact on their operation and performance. Based on their independence, we analyzed them, according to which statistical characteristics they show, and whether it is possible to infer the expected value of their revenue.

3.4.1. Independent baths (1)

In 2022, the number of visitors to stand-alone baths will exceed 16 million. The most common annualised figure was under 32,000, with one third (32%) of independent baths reporting such a figure. Even the next category represented a significant share, with one in four (25%) baths registering 61-90 thousand guests in the year. One in ten baths reported between 91 and 119 thousand visitors. The remaining one third of baths generated even more turnover than this.

In 2022, independent baths had a total revenue of USD 109 million. The higher the turnover of a bath, the lower its incidence. Around two thirds of stand-alone baths reported a turnover of less than USD 350 thousand. Those with turnover between US 350 and 686 thousand account for 15% of the group. One in four of the stand-alone baths had revenues above this level.

If we look at the distribution of the specific value already introduced above, i.e. the revenue per guest, we obtain the following frequency diagram (Figure 7).

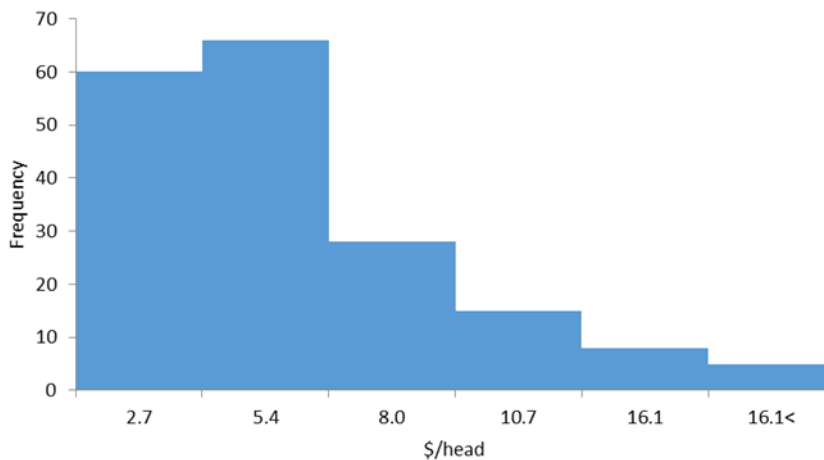


Figure 7. Distribution of revenue per guest in independent baths.2022
Source: HCSO database, 2022

Our average specific indicator is 5 USD/guest for independently operating baths. The highest value is above 24 and the lowest is below 0.2. One in three baths is in the under 3 USD/person range. Every additional third bath unit relied on a turnover between 3 and 5 USD/guest. For one in six companies, the specific indicator fell within the range of USD 5 to 8 thousand. The right-skewed graph shows that the higher the revenue per guest, the fewer the number of businesses. The relative standard deviation $(3.96/4.82) = 0.821$ is not very high, but still shows a strong heterogeneity.

3.4.2. Non-independent baths (co-operating with accommodation) (2.)

Some accommodation establishments are not operated as a separate business entity but in conjunction with a place of accommodation. The accommodation establishments included here which provide spa services in parallel with their main activity (for their hotel and/or bath guests) should provide estimates of guest flows and revenue if they do not have the exact figures. Examples are spa hotels, thermal hotels or wellness hotels.

The 168 spa hotels included generated a combined total of 14 million guests, four fifths of which had less than 100 thousand visitors. In 2022, every tenth unit could provide 100,000 to 200,000 people with bath services. Only 18 large spa hotels can boast a guest flow above that. The revenue of the members of this group is already much more respectable than that of the previous group, because here they work together with the accommodations, and the part for the bath is sent based on an estimate.. Of the baths with accommodation, 73% recorded revenues of less than USD 2,6 million, with a further 13% in the range between USD 2,6 and 5,3 million. Other large hotels fell into the higher revenue brackets.

The average in this case is much higher than for stand-alone baths (111 USD/person) and the dispersion is also much larger due to the higher maximum value (Figure 8).

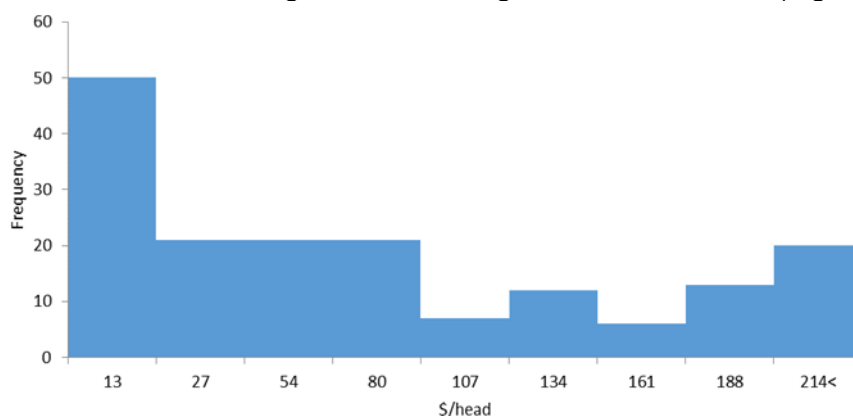


Figure 8. Distribution of revenue per guest of baths operating together with accommodation 2022

Source: HCSO database, 2022

In the last linked band (above USD 214 per person), there are 20 baths with significant specific revenues. These would have been individually grouped into separate categories, but for data protection reasons they were aggregated into one group.

3.4.3. Baths are not independent but part of other institutions (3)

Third category, where a bath is not operated together with accommodation but as part of another establishment. This includes school swimming pools, college swimming pools, swimming pools in cultural centres, leisure centres, but also swimming pools in beaches, camping sites or medical institutions. This category includes fewer swimming pools (83).

In 2022, their total number of visitors will be 3.6 million. The most common category is under 10,000 visitors, with 30% of them reporting this. One in five reported between 10 and 20 thousand visitors. A further 40% reported more than this.

The total revenue of the baths included in this category amounted to USD 20 thousand. One in three baths had a turnover of less than USD 13 thousand, one in five had an income of USA 13-26 thousand and 45% had an income of more than USD 13 thousand.

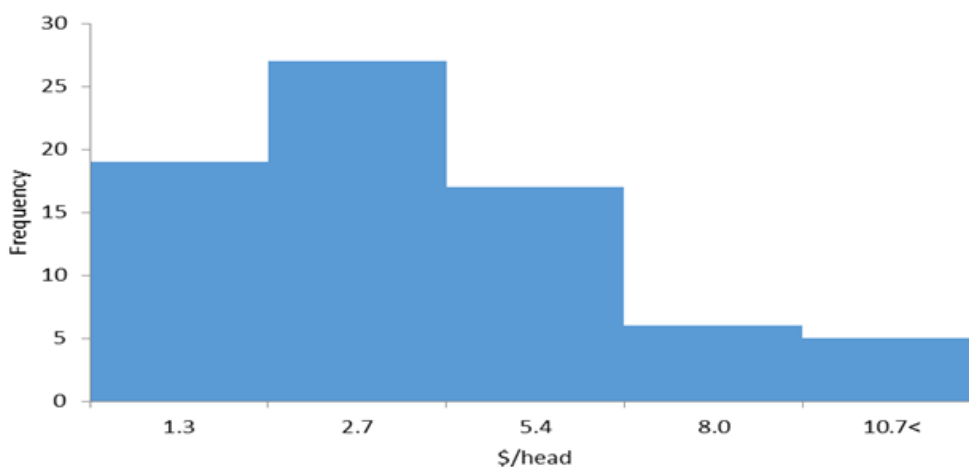


Figure 9. Distribution of institutional baths' revenue per guest

Source: HCSO database, 2022

The distribution of the revenue per guest is as shown in the figure above (Figure 9). About one third of the baths in this category have a revenue below USD 1,3-2,7 per person. One fifth of them fall below 1.3. A further fifth have a specific turnover of between HUF 1,3 and 2,7 per person. This group includes several baths with low or even zero revenue. These are mostly school swimming pools, which do not charge external entrance fees but have a guest flow. There are also non-profit institutions which also generate guest flow but no commercial revenue.

3.5. Comparisons

Table 2. Main statistical indicators for the three groups of bathes 2022

Independent baths (1)		Hotel baths (2)		Institutional baths (3)	
Revenue_per_guest (\$/head)		Revenue_per_guest (\$/head)		Revenue_per_guest (\$/head)	
Average	4.8	Average	111.5	Average	4.4
Median	3.6	Median	49.0	Median	1.7
Standard deviation	4.0	Standard deviation	237.1	Standard deviation	1.7
Minimum	0.2	Minimum	1.4	Minimum	0.0
Maximum	23.9	Maximum	2 257.0	Maximum	138.7
Number	182	Number	168	Number	83

Source: HCSO database, 2022

The range, i.e. the difference between the maximum and minimum values, differs significantly for the values calculated for the specific indicator in the three types of bathing groups. In the present case, 23.7, 2255.6 and 138.7 USD/person. The median value of the second group is significantly different from the others, 49 USD/head, while the first group has a median value of 1342 and the third group 629 HUF/person.

The mean values are also significantly different (4.8, 111.5, 4.4 USD/person), but here again the means of the first and third groups are closer. The second group shows the largest variation, with a wide range of specific revenues. Even with a relatively lower number of visitors, baths with accommodation have a higher income, with the attraction of the accommodation and other services generating the higher value per capita.

In the first, homogeneous group (1), there is a high concentration of stand-alone baths, with low dispersion, even with a high number of units. The group of accommodation baths (2) also includes several types of baths, from beaches and campsites with accommodation to leisure baths. Extremely high values are almost always associated with thermal or spa baths, but also hotels with wellness facilities. As there is a large variance within this group, this group will not be considered in further analyses. In the third category (3), swimming pools and community pools have low overall rates.

It is now possible to compare the two main indicators (revenue and number of guests) in a regression function (Figure 10), and for the first group, a positive relationship between the two indicators is expected.

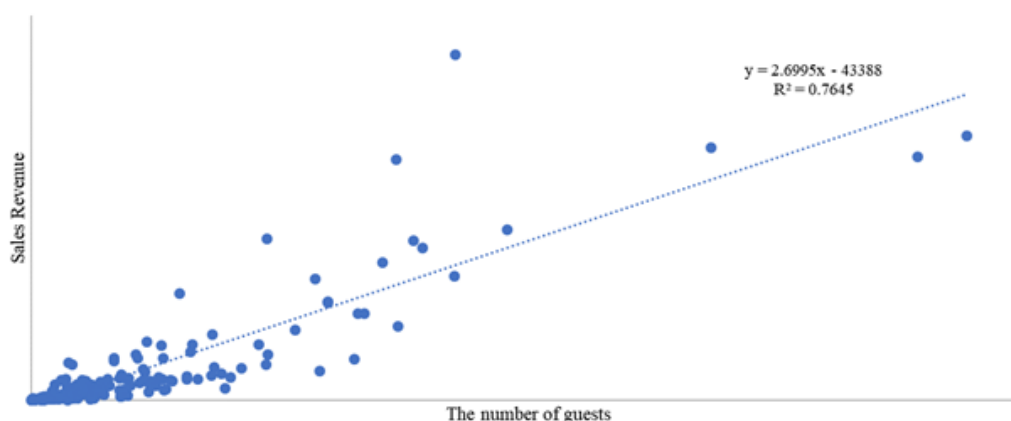


Figure 10. Indicators of independent baths (1), 2022

Source: HCSO database, 2022

However, the apparent correlation does not imply causation, but quantifies the strength of the relationship between the two indicators. We assumed a linear relationship, with an R squared value of (0.76), suggesting a close relationship despite some outliers being detected. The outliers represent a real value, as does the set of scattered points along the midline.

In the case of baths operating together with accommodation, this relationship is not clear, $R^2=0.35$ indicates a weak relationship. Here, other factors may have an impact on the evolution of revenue, as already indicated, such as type of bath or other developments. Here it is safe to assume that the higher revenue was not only generated by the bath's guest numbers. Visitors to the hotel also took into account the other advantages of the hotel and its surroundings when booking. For the third group, baths operating in conjunction with other institutions, the interaction is medium ($R^2=0.69$). The renovation of baths and the use of subsidies (which may be recouped later) may be important reasons for the increase in revenue.

In the case of stand-alone baths, turnover is strongly dependent on the evolution of guest flows. However, for these baths, it is essential that recreational and health services are available to the local population without having to travel to distant locations. Therefore, their maintenance is important, in addition to less income, state support is also needed. Both residents and tourists visiting the area have access to both paid and socially subsidised services, the latter mainly including rehabilitation treatments for chronic rheumatology, orthopaedics, neurology, vascular diseases and therapeutic swimming.

Hotel units with accommodation have the highest revenue per capita and the highest median (mean) (USD 49 per person). The pandemic has also led to a decline in this sector, but by 2022, hotel revenues have exceeded even the pre-pandemic level. The average price level increase contributed to this, due to the economic downturn caused by the epidemic and the subsequent Ukrainian-Russian war. Despite this, their turnover is growing, as wellness hotels are a tourist attraction for the modern man, with a lifestyle that includes physical, mental and spiritual health. The baths contribute to this by offering various services (salt chamber, sauna or massage).

The turnover of baths operating in conjunction with other institutions is lower because they are run, among other things, by public bodies or on a non-profit basis. Gymnasiums, dormitories, hospitals, community centres have low entrance fees (or can be used with social security subsidies) and therefore generate lower turnover. The very low median value indicates a lot of low revenue (1.7 USD/person), but the group includes some higher revenue baths, which push up the average value. Here again, it should be pointed out that swimming pools linked to public facilities are the ones that most improve the lifestyle of the local public with the services they offer, including fitness, gym or massage, in addition to swimming.

4 Conclusion

The baths in Hungary play a significant role in improving the quality of life for the population, offering excellent support and recreational infrastructure for both leisure and competitive sports [10, 12]. The social role of these baths is also evident as they are not merely part of holiday activities but also serve the needs of the local population for regular relaxation and recreation in terms of health maintenance [17]. This social commitment is supported by numerous studies, which show that even those baths operating independently without accommodation facilities, while generating smaller revenues, are still important to the community by providing access to health maintenance and daily recreation opportunities [14].

Touristically popular baths that operate alongside accommodation services realize the highest revenues, thus their economic benefits are more pronounced. These baths have become key attractions and draw factors in the health tourism market, significantly contributing to the development of local and international tourism. Such baths not only serve the physical well-being of visitors but are also significant economic drivers, creating jobs, fostering the growth of local businesses, and contributing to the economic stability of regions.

Overall, it can be said that Hungarian baths are not only important as health and recreational centers but also as significant social and economic entities [1,2,8]. Besides improving the quality of life for the local population, the baths play a crucial role in boosting tourism, increasing economic revenues, and strengthening local communities. Future developments and investments should consider the multifaceted impact of these baths, as with proper support and enhancements, both their social and economic benefits can be further exploited.

The closures due to the coronavirus also reduced the visits to the baths in Hungary, and a similar decline in demand for baths was observed in Slovakia [15]. Other studies reported that after the COVID-19 pandemic, the baths successfully attracted clients back by offering services that helped in recovering from the coronavirus [9, 11].

Despite the challenges posed by the COVID-19 pandemic, Hungarian thermal baths and health tourism facilities were able to adapt and revive. The sector's resilience and state support contributed to making the baths attractive destinations again for both domestic and international tourists. Data shows that bath attendance and revenues are continuously increasing, reaching record highs in 2022.

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