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**Survey of health insurance and utilization indicators of spas and other  
medical services in Hungary**

**Doctoral (Ph.D.) thesis**

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## 1 Introduction

The joint application of traditional and integrative medicine in patient care has recently become more well-known and widespread with the aim to achieve the best possible recovery. The importance of hydrotherapy and balneotherapy as a forms of complementary and alternative medicine providing remedy for various ailments and conditions was already known in ancient times and several treatments were developed that can be classified into this category. As a part of modern medicine, these medical treatments continue to be widely used for their positive effects in the treatment of various diseases.

In addition, the environmental parameters of spas are also significant, as it may serve as a kind of psychological impulse having an impact on the healing process of patients. Patient satisfaction can influence clinical outcomes, therefore, a close examining of this aspect may prove a potent factor in the assessment and evaluation of the success of physicians and hospitals. The knowledge of healthcare professionals as to the subjective experiences of patients and their levels of satisfaction with care is often limited, that is why it would be of great importance to conduct more intense research in this direction. An institution is more likely to provide successful services if the patients' expectations are recognized and taken into consideration at the beginning of treatment.

The above services are mainly used for rehabilitation treatments aimed at improving the function of chronic rheumatological, orthopaedic, traumatological, gynecological, neurological, dermatological and circulatory diseases. Limb injuries, including knee and leg injuries, are the most common types that require post-injury rehabilitation. This type of injury usually results from slips or falls (57%) and traffic-related accidents (22%) and represents a very serious disease burden for society (Suys KP et al, 2016; Banerjee M et al, 2013). Based on a survey conducted in the United States, of the approximately 31 million injuries treated in emergency departments, half of the cases were due to limb injuries. The amount spent on the treatment of trauma patients cared for in active inpatient care settings has more than doubled over the course of 10 years, increasing from 12.0 billion USD to 29.1 billion USD (DiMaggio C et al, 2016). In Singapore, over 5 years, approximately 560 [79.3%] male and 116 [20.7%] female patients required prolonged hospitalization following a traumatic injury. 45.4% of those affected were 21-40 years old, so they were active, mainly young men. On average, they spent 18.8 days in hospital, which means a considerable financial burden and loss of work in an otherwise able-bodied, productive age group (Tan JYH et al, 2022). In Hungary, the health care

costs resulting from treating people with lower limb injuries are considerable, and a large number of cases involve young and middle-aged men. In the case of women, the number of patients and the corresponding expenses increase proportionally with age. Treating trauma patients is a very complex and multifaceted task. If the patient gets to the right place and receives the right care in time, we can influence the economic aspects of the costs related to the disease. In this way, the time the person is absent from work, the costs of care, and the utilisation costs of various treatment modalities (such as medicines, home care, medical aids, imaging diagnostic procedures, etc.) could be reduced. This is supported by the fact that for patients admitted to and treated at the appropriate department, direct hospital costs decreased (from 5,639 USD ( $\pm$ 4,897 USD) to 4,941 USD ( $\pm$ 4,740 USD),  $p=0.006$ ) and hospital complications occurred less frequently (from 13.5% to 7.8%,  $p<0.001$ ), slightly more patients were discharged home earlier (73.8% instead of 78.9%,  $p=0.02$ ), consequently, the number of hospital days decreased (Bauman ZM et al, 2022).

Apparently, hospital care can only work efficiently and economically in the long term if it is followed by a properly designed rehabilitation plan and which is then started in time. In addition to the patient's attitude and compliance, the success of a therapy largely depends on the cooperation of the members of the interdisciplinary rehabilitation team. Qualified spas can be excellent places for both prevention and aftercare, thanks to an established work ethic and a devoted team with a wide array of knowledge and skills from various fields of healthcare. Musculoskeletal diseases are one of today's public health concerns, and with the aging of society, their prevalence is increasing having an significant impact on economy, healthcare and society. It would be important to educate and inform the public as soon as possible about what types of medicinal water and other physiotherapy treatments can be helpful in the treatment of various diseases, since timely and appropriate medical care can result in significant improvement in function and thereby, reduce the related burden of disease.

## 2 Aims

The aim of the dissertation was to analyse the annual national costs of various services provided by spas and other institutions providing medical care and the evaluation and time series analysis of patient traffic data.

In view of the prevalence of knee and leg injuries and the importance of subsequent rehabilitation, an additional goal was to analyse the epidemiological and health insurance disease burden occurring with the utilisation of such therapeutic modalities.

Furthermore, we also intended to assess and evaluate patient satisfaction in selected facilities as it may largely impact the efficacy of rehabilitation.

Main aims of the study are summarised as follows:

1. To determine the **use** of health care services supported by the national health insurance fund and their annual **social insurance coverage** in spa institutions receiving public funding by analysing the health insurance indicators of the support costs of public medical care, occupational accidents and occupational diseases between the years 2009 and 2019.
2. To analyse **regional inequalities** in the utilisation of spa services with special focus on the South-Danubian region.
3. To determine the annual national epidemiological and health insurance **disease burden** of the various forms of care used after knee and leg injuries in Hungary. Examination of the distribution of costs and patient traffic data by age group and gender per 100,000 inhabitants.
4. Assessment of **patient satisfaction** in two healthcare institutions providing spa services from the South-Danubian region (Baranya county). To provide a comprehensive picture on factors influencing patient satisfaction, determinants of quality care from the patients' perspective in the selected institutions.

## 3 Detailed results

### 3.1 Utilization indicators of balneotherapy in Hungary between 2009-2019

**Introduction:** The role of spa therapy is well defined and its importance has significantly increased in the healthcare but the utilization indicators of the implemented treatments are less known. The objective of our study was to analyze the utilization and the social insurance indicators of the healthcare publicly financed by health insurance in spa institutions.

**Data and methods:** The data used for the analysis were derived from the funding database of the National Health Insurance Fund of Hungary. The period examined covered the years between 2009 and 2019. The spa treatment counts, social insurance expenses, the territorial inequalities in utilization, sex and age distribution of the treatments were examined.

**Results:** The treatment counts were the highest (7 349 587) in 2009 and they gradually decreased with 5 934 147 treatments by 2019. ‘Spa pool of medicinal water’ treatment was the most common care in each year which incidence showed a downward trend during the past years: 2 544 617 treatments were performed in 2009 but 2019 showed only 1 638 925 treatments.

We found the highest health insurance expenditures in 2016: 4.261 billion HUF. In the previous years, there was a lower health insurance expenditure: in 2010: 3.928 billion HUF, in 2011: 3.921 billion HUF and in 2012: 3.875 billion HUF, but the lowest was in 2019: 3.865 billion HUF.

The utilization made the highest incidence of treatments in Csongrád county with 11 782/10 000 inhabitants and 7110 thousand HUF/10 000 inhabitants of social security subsidy in 2019. The lowest utilization counts for treatments were found in Nógrád county with 3 062/10 000 inhabitants and 2121 thousand HUF/10 000 inhabitants of social security subsidy. The highest utilization indicators were found in the age group between 60 and 69 in the distribution of population and genders.

**Conclusions:** In the utilization of spa therapy funded by health insurance fund, no significant change has occurred during the past years but territorial discrepancies can be seen in sex, age, and county breakdown.

Denomination	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
normative subsidies	3.728	3.611	3.612	3.570	3.803	4.105	4.084	4.126	3.953	3.846	3.711
public health care	164	160	160	154	150	141	132	121	117	125	140
occupational accident and diseases	8	10	10	10	11	12	13	14	14	12	14
<b>Total social insurance subsidy, million HUF</b>	<b>4.038</b>	<b>3.928</b>	<b>3.921</b>	<b>3.875</b>	<b>4.106</b>	<b>4.258</b>	<b>4.229</b>	<b>4.261</b>	<b>4.085</b>	<b>3.983</b>	<b>3.865</b>

**Table 1**

*Annual social insurance costs for spa care (2009-2019, million HUF)*

<b>Form of service</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Spa pool of medicinal water	2.544.617	2.344.694	2.255.680	2.108.371	2.048.262	2.076.148	1.979.780	1.898.338	1.799.683	1.716.647	1.638.925
Medical health massage	1.972.957	1.828.822	1.746.512	1.601.505	1.587.316	1.642.037	1.601.668	1.590.565	1.519.04	1.474.577	1.421.430
Sub-aquean health care gymnastics for groups	638.148	612.920	609.717	596.949	619.421	686.773	673.278	700.479	684.434	686.262	658.275
Sub-aquean spray massage	588.944	563.716	544.579	520.005	516.678	521.369	507.700	500.868	478.279	473.094	444.785
Health swim therapy for groups under 18	565.368	586.517	584.623	602.343	609.142	630.696	606.164	581.557	574.457	513.831	490.576
Mud pack	482.595	487.800	513.010	521.358	543.720	597.683	588.415	592.235	553.645	548.550	531.075
Medicinal weight-bath	236.551	218.823	225.891	230.012	252.810	282.810	293.634	316.277	307.653	307.266	304.128
Complex balneo-therapeutical service	228.001	230.346	263.813	273.275	272.799	279.065	291.125	317.407	304.852	313.863	316.231
Effervescent bath	82.711	85.319	93.121	90.819	94.441	96.073	100.384	97.781	93.531	104.004	97.200
Tub-bath of medicinal water	9.695	8.480	7.169	6.559	8.513	8.013	9.038	8.878	8.599	6.651	6.405
Carbon-dioxide bath				7.008	16.996	18.879	22.021	20.400	21.322	28.472	25.107
<b>Total</b>	<b>7.349.587</b>	<b>6.967.437</b>	<b>6.844.115</b>	<b>6.558.204</b>	<b>6.570.098</b>	<b>6.839.546</b>	<b>6.673.207</b>	<b>6.624.785</b>	<b>6.345.495</b>	<b>6.173.217</b>	<b>5.934.147</b>

**Table 2**

*Annual number of spa treatments subsidised by social insurance by type of treatment (2009–2019)*

### 3.2. Regional inequalities in financing indicators for spa care

**Introduction:** Our aim is to analyze the financing and the use of physiotherapy-type spa services, those statements in regions, in particular highlighting data of the South-Danubian region.

**Data and methods:** Our research is retrospective, quantitative and descriptive. Our data were obtained from the Central Bureau of Statistics. The list of spa and other medical care contained 11 activities. The examined period is 2014 and 2019.

**Results:** The number of treatments of 11 spa and other medical supplies, funded by the National Health Insurance Fund were 6,839,546 in 2014, falling to 5,934,147 in 2019. The first three most common treatments in both years (2014, 2019): 1. pool with medicinal water therapy 2,076,148, 1,638,9252, medical massage 1,642,037, 1,421,430, 3. underwater group physiotherapy 686,773, 658.275. 11.41% of all procedures were enlisted in the South-Danubian region (780,477 treatments) and in 2019 this percentage has decreased to 8.93% (529,737 treatments). The most common types of treatment were similar to those found nationally (2014, 2019): 1. pool with medicinal water therapy 194,976, 130,301, 2. medical massage 179,003, 125,007, 3. underwater group physiotherapy 87,176, 59.733. Sequence of treatments in relation to the Social Insurance in 2014(thousand HUF): 1. medical massage 933,229, 2. pool with medicinal water 686,826, 3. complex bath medical-care 621,361. In 2019 (thousand HUF): 1. medical massage 808,201, 2. complex bath medical-care 701,334 3. pool with medicinal water 539,349. The total National Social Insurance subsidy was 4,299,171, of which 564,838 were in the South-Danubian region, and for 2019, the amount of funding paid in the area has decreased to 388,023 HUF.

**Conclusions:** Regional differences may arise from the fact that the opportunities provided by the environment do not make the treatment available in some regions. As a long term goal cooperation between the tourism industry and the profession of doctors needs to be developed to overcome regional differences.



### 3.3 The nationwide epidemiological and health insurance disease burden of knee and lower leg injuries in Hungary

**Introduction:** Injuries to the knee and lower leg pose a great burden for the individual and society. The aim of our study was to determine the annual epidemiological disease burden and the health insurance treatment cost of knee and lower leg injuries in Hungary.

**Data and methods:** Data were derived from the financial database of the Hungarian National Health Insurance Fund Administration (NHIFA), for the year 2018. Data analysed included annual health insurance costs and its distribution and annual patient numbers and prevalence per 100,000 population calculated for age groups and sex. Patients with knee and lower leg injuries were identified with the following code of the International Classification of Diseases 10<sup>th</sup> revision: S80-S89.

**Results:** The most expensive insurance treatment category was acute inpatient care, presenting 18,398 patients in total (9,868 men, 8,530 women). Based on patient numbers in acute inpatient care, prevalence in 100,000 among men was 211.2 patients, among women 167.0 patients, in total 188.1 patients. In 2018, the NHIFA spent 8.808 billion Hungarian Forints on the treatment of patients with knee and lower leg injuries (32.59 million American Dollars, or 27.62 million Euros). Acute inpatient care with 61.4% of total health insurance expenditure was the main cost driver. 52.0% of costs was spent on the treatment of male, while 48.0% on female patients. Until the age of 49, the number of patients and their costs are higher for men, while those over the age of 50 are higher for women.

**Conclusions:** Acute inpatient care was the major cost driver. The prevalence of the disease was 26 % higher in men compared to women.

Form of supply (NHIF)	Patient number (piece)			NHIF financing (Ft)		
	Men	Woman	Together	Men	Woman	Together
General practitioner care	45.330	42.009	<b>87.339</b>	101.906.298 Ft	89.323.551 Ft	<b>191.229.849 Ft</b>
Home care	736	1.487	<b>2.223</b>	44.458.053 Ft	89.543.034 Ft	<b>134.001.087 Ft</b>
Patient transport	3.327	5.376	<b>8.703</b>	91.089.157 Ft	132.247.937 Ft	<b>223.337.095 Ft</b>
Rescue	4.766	5.773	<b>10.539</b>	--	--	--
Outpatient care	106.058	106.234	<b>212.292</b>	1.014.785.581 Ft	960.913.171 Ft	<b>1.975.698.752 Ft</b>
Nursing care	9	12	<b>21</b>	79.520 Ft	95.354 Ft	<b>174.874 Ft</b>
Laboratory care	3.700	3.152	<b>6.852</b>	5.428.060 Ft	4.271.901 Ft	<b>9.699.961 Ft</b>
CT, MRI	4.045	3.727	<b>7.772</b>	79.367.331 Ft	67.674.568 Ft	<b>147.041.899 Ft</b>
PET	0	0	<b>0</b>	0	0	<b>0</b>
Active inpatient specialised care	9.868	8.530	<b>18.398</b>	2.866.754.067 Ft	2.540.567.513 Ft	<b>5.407.321.581 Ft</b>
Chronic inpatient care	330	492	<b>822</b>	64.430.190 Ft	91.829.100 Ft	<b>156.259.290 Ft</b>
Itemised account	1	0	<b>1</b>	71 Ft	0	<b>71 Ft</b>
Drug price support	12.814	12.740	<b>25.554</b>	17.674.497 Ft	18.049.136 Ft	<b>35.723.633 Ft</b>
Medical aid price support	12.847	12.969	<b>25.816</b>	296.006.421 Ft	231.883.955 Ft	<b>527.890.376 Ft</b>
<b>Total</b>	--	--	<b>--</b>	<b>4.581.979.247 Ft</b>	<b>4.226.399.221 Ft</b>	<b>8.808.378.467 Ft</b>

## 1. táblázat

*Annual number of patients and health insurance expenditure by type of care for people with knee and leg injuries (NHIF, 2018)*

### 3.4 Patient satisfaction survey in hospitals providing spa care in Baranya county

**Introduction:** Balneotherapy and hydrotherapy treatments with a proven therapeutic effect are of great help to patients in early recovery. The aim of our study is to assess patient satisfaction in two health care institutions in Hungary.

**Data and methods:** We conducted a questionnaire survey among the patients of two spas and other hospitals (n=128) in Hungary in 2019. The obtained results were evaluated with SPSS 25.0 software. The significance level was determined to be  $p < 0.05$ .

**Results:** 74% of the respondents were female (n=95) and 26% were male (n=33), of whom 47% (n=60) were between 61 and 70 years of age. 72% (n=92) of the respondents were informed about the discounted treatments by their specialist and the majority were patients who return annually (n=106), who come again mainly (44%) for previous good experiences. They thought they would discover an 88.5% improvement in both the quality of care and treatments. Results of K1 and K2 hospital staff: help (K1: 6.61, K2: 6.05,  $p=0.001$ ), pain relief (K1: 6.08, K2: 4.95,

p=0.015) problem solving (K1: 6.16, K2: 5.46 p=0.009), information provision (K1: 5.82, K2: 5.05, p=0.050) were significantly higher in K1 hospital than in K2 hospital. In the overall picture of the institution, K2 achieved a higher result in terms of health improvement, despite the former lower evaluations, but there was no significance (K1: 5.86, K2: 6.00, p=0.584).

**Conclusions:** Learning the use of treatments and patient satisfaction, constructive suggestions can be made to improve the quality of patient care.

<b>Question</b> <i>Satisfaction with hospital staff</i>	<b>No. 1 hospital</b>	<b>No. 2 hospital</b>	<b>Deviation</b>	<b>Mann-Whitney U (p &lt;= 0.05)</b>
The hospital staff is polite and kind	6.39	5.51	0.88	0.189
Patient admission is smooth and well organized	6.35	5.51	0.84	0.218
Nurses and doctors spend enough time on the patient	6.55	6.29	0.26	0.494
Help from staff in case of problems	6.61	6.05	0.56	<b>0.001</b>
In case of pain, the staff is helpful	6.08	4.95	1.13	<b>0.015</b>
Discuss concerns with staff	6.16	5.46	0.69	<b>0.009</b>
Members of staff introduced themselves and explained their responsibilities	5.82	5.05	0.77	<b>0.050</b>
Doctors are mindful of the presence	6.39	5.24	1.15	0.211
Information about medicines to take	5.92	4.98	0.95	<b>0.021</b>
When leaving the hospital, information about signs of deterioration that requires a doctor	6.27	5.49	0.79	<b>0.007</b>

<b>Question</b> <i>Satisfaction with infrastructure and catering</i>	<b>No. 1 hospital</b>	<b>No. 2 hospital</b>	<b>Deviation</b>	<b>Mann-Whitney U (p &lt;= 0.05)</b>
Hospital conditions are adequate	6.27	6.15	0.13	0.929
The condition of the restrooms is good	5.65	5.20	0.45	0.228
The treatments room is in good condition	6.43	6.10	0.33	<b>0.023</b>
The amount of food is right	6.63	6.61	0.02	0.289
The quality of the food is good	6.57	6.34	0.23	<b>0.049</b>

<b>Question</b> <i>An overview of the spa</i>	<b>No. 1 hospital</b>	<b>No. 2 hospital</b>	<b>Deviation</b>	<b>Mann-Whitney U (p &lt;= 0.05)</b>
Health has improved	5.86	6.00	-0.14	0.584
Recommend a hospital to friends and family	6.43	5.85	0.58	0.208
Satisfaction with the general state of Hungarian health care	4.12	3.95	0.17	0.965
Satisfaction with hospital care	6.63	6.24	0.38	0.149

## 4 Discussion

In addition to research focusing on the effectiveness of treatments related to spas and other medical services, related burden of disease could be optimized by obtaining more information about their utilization and financing indicators. Recommendations could be formulated for planning care strategies and for improving the allocation of costs. In order to reduce the high costs of rehabilitation, analyses similar to ours can be of great importance, since the costs of medical rehabilitation are extremely high worldwide. Due to the high incidence and prevalence of diseases affecting the locomotor system, the related treatment costs are also expected to increase.

In our case, the increase in the number of patients presenting at spas can be observed from the age of 40 years. The separation of the gender ratio begins in the 40-49 age group, but the most marked difference is from age 50 onward with higher female spa utilisation numbers. We assume that it is problems affecting the locomotor system that are in the background of the higher number of cases appearing with advancing years. Comprehensive publications have also showed that the incidence and prevalence of many diseases affecting the locomotor system are increasing in the older age group, their appearance is more common in the female sex, and as the population of Western countries is aging, this number will only continue to increase further (Safiri S et al, 2019; Lamb JN et al, 2014; Chadha M et al, 2022). Balneo therapy is used in many European countries, including Hungary, for the treatment of very common rheumatic diseases as an effective, non-pharmacological method. Despite positive results, the number of treatments at the 'Medicinal Spa Pools' in Hungary showed a decreasing trend over the course of 11 years examined- the highest utilisation numbers were detected in 2009 (2,544,617), but by 2019 this number had significantly decreased (1,638,925). Overall, we can conclude that there was a significant decline in the number of treatments performed during these 11 years (2009-2019), but when analysing some forms of care, we found a more varied picture. The majority of treatments were "passive" treatments as opposed to active forms of therapy.

At county level, in 2019, the highest number of cases per 10,000 inhabitants was in Csongrád county, and the lowest in Nógrád county .

The total number of treatments in the South Danubian region showed a decrease above the national average, but the distribution of treatment types remained practically unchanged.

Between 2014 and 2019, the amount of social insurance reimbursement paid decreased nationally by 10%, while in South Trans-Danubian by 31%, which roughly corresponds to the

decrease in the number of cases. However, the frequency/number of medical treatments is not always the same as the amount of the social insurance subsidy paid, which can be explained by the fact that the number of high-cost treatments - such as complex spa treatments - is often higher, and consequently the amount of subsidy spent on such forms of treatment is higher as well.

Cost-effectiveness analyses are important factors in health policy decision-making and the optimization of resource allocation. In the period between 2009 and 2019, the amount of funding spent on treatments was approximately HUF 4 billion. An exception to this are the periods between 2010-2012 and 2018-2019, when the paid subsidy fell short of HUF 4 billion - HUF 3,928 million, HUF 3,921 million, HUF 3,875 million, HUF 3,983 million, HUF 3,865 million. During this time, the normative transitional support showed an increase (by 10% until 2016), then it reached the 2009 value again. The amount financed for the expenditure of industrial accidents and occupational diseases increased by a total of 85% over the years, the costs of public medical care (prescription exemption) decreased by 35% until 2016, and then by 2019 we could observe a 10% increase.

Despite positive trends, medicinal spa treatment numbers have fallen by 20% in Hungary and the social insurance subsidy spent on such forms of care also decreased by 5% during the 11-year period examined.

Traumatic injuries are very common in all countries. Especially among the adult, working-age population, injuries affecting the lower limb are prevalent, which can negatively affect work performance and quality of life, thus resulting in a significant burden both from the point of view of the individual and society (van Dreumel RL et al, 2015).

Our study revealed that regardless of gender and age, the number of patients in active inpatient care is proportional to health insurance costs. At the same time, the estimated prevalence of knee and leg injuries varied by gender and age group. The prevalence per 100,000 population showed that the number of male patients in the 0-39 age group is almost twice the number of female patients in the same age group. The underlying reason is probably that men of active age tend to engage in more extreme forms of leisure time physical activity. In women, patient numbers and related health insurance costs increased proportionally with age. In their case, we must highlight osteoporosis as the main indicator, which is the most common cause of traumatic fractures in the elderly population.

After hospital care for people having suffered knee and leg injuries including further rehabilitation, care, medication therapy, or the use of assist devices that may last for years may often be indicated generating additional health insurance costs in the case of both the

young and the elderly population. As mentioned earlier, the treatment modalities offered by certified spas can be recommended to mitigate this issue, and they can also help in successful rehabilitation, normalising the burden of disease, thereby increasing health-gain levels and improving resource allocation.

How a patient responds to treatments is greatly influenced by the individual's psychological and emotional condition. An effective service is more likely to be beneficial if they are in line with the patients' expectations. By assessing the positive and negative experiences gained during care, we can gain valuable information about patient satisfaction, which can prove an excellent tool for improving quality of care.

The prevalence of diseases is increasing in almost all areas of medicine due to harmful environmental effects and unhealthy life styles several of which can however be successfully alleviated by the large variety of treatments available in spas.

Emphasizing the effectiveness of the treatments available in qualified spas (prevention, therapy, rehabilitation) can be a solution to reducing the high overall economic burden and the success of treatments thereby reducing both the social and individual burdens of aftercare. Therefore, analyses and investigations of the utilisation of treatments associated with diseases and the economic impact of disease costs are of great importance.

## 5 New results

Our new results presented in the dissertation are summarized as follows:

1. We performed a time-series analysis of the use of treatments and **social insurance funding** of publicly funded spas. We determined annual social insurance costs associated with public medical care, occupational accidents and occupational diseases.
2. Based on the financing database of the National Health Insurance Fund, we determined the usage indicators of domestic qualified spas, as well as the **regional differences** in the annual health insurance costs spent on the treatment of patients who presented for therapy. We evaluated prevalence rates and the amount of regional funding based on the annual patient numbers in the southern Trans-Danubian region.
3. We identified the frequency of forms of care used in the care and follow-up of one of the most common locomotor, traumatological syndromes, knee and leg injuries, and the **annual health insurance burden** spent on different treatment modalities. We analysed the difference between age groups and gender in the case of those who suffered injuries.
4. Based on the responses of patients of the spa hospitals in Baranya county, we assessed **patient satisfaction** and the main influencing factors, thus gaining information about the hospitals and the quality of care offered by the institutions.

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## 7 Publication list

### **PUBLICATIONS ON THE SUBJECT OF THE THESIS**

**Varga V**, Sélleyné GyM, Juhász R, Koczka V, Szóts B, Molics B, Boncz I. Patient Satisfaction Survey in Hospitals Providing SPA Care in Hungary. *Studia Universitatis Babes-Bolyai Educatio Artis Gymnasticae*, 2022; 67(1): 5-18.

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## **AWARDS IN THE TOPIC OF THE DISSERTATION**

2018 - New National Excellence Program Of The Ministry Of Human Capacities

2017 - Scientific Student Debate - III. place

2017 - New National Excellence Program Of The Ministry Of Human Capacities