

UTILIZATION AND HEALTH INSURANCE INDICATORS OF OUTPATIENT PHYSIOTHERAPY ACTIVITIES

Doctoral (Ph.D.) thesis

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1. INTRODUCTION

In the course of medical therapies physiotherapy applying the energies of nature is related to medical rehabilitation procedures, its place and application is well determined in our country. Physiotherapists are important and in certain fields determining members of the rehabilitation working group.

During rehabilitation medical attendance is only the first step which may be a possible effective solution when it would be followed by adequate after-care. The importance of after-care is confirmed by the professional protocols of the Ministry of Health prepared by professional colleges where the main assignments of rehabilitation are specified. Research results confirm that the most successful rehabilitation can be reached by the mapping of its comprehensive components from different aspects.

The list of comparative analyses about the more effective application of newly presented methods and treatments of this specialty is extensive in point of all fields. Analysis of health care techniques possesses wide range domestic and international traditions both on medical and pharmaceutical line. However, relatively few literary data are provided about the activities of health care professionals like the activities of nurses, physiotherapists, dietitians. Nevertheless, problems related to financing emerge frequently in this field which makes everyday professional work more difficult.

Tertiary prevention methods, rehabilitation procedures are less examined in literatures, as physiotherapy procedures, in spite that this professional field – in parallel with the improvement of health care profession – went through a significant improvement in Hungary in the past two decades. Literary background of the utilization of physiotherapy care is also poor in our country.

Analysis of health care services from different aspects is indispensable for the planning, implementation and monitoring of more aimed more effective and more economic services. Mapping of paramedical activities and answering financing and economic questions of prevention proceedings and medical care are equally important.

2. AIMS

The topic of this study examines not the close clinical relations and practical applications of the professional field of physiotherapy in practise, but fundamentally it is a health insurance, health-economic research work built on database analysis.

Accordingly, our aim was to map the health insurance relations of physiotherapy services.

In the course of our research the following questions were planned to be answered:

1. Define the annual health insurance expenditures of ambulatory physiotherapy activities financed by the National Health Insurance Fund Administration.
2. Map the utilization indicators of physiotherapy outpatient services reimbursed by the NIFHA.
3. Determine the annual NIFHA financing rates and the utilization indicators of the most frequent pathographies (traumatology, orthopaedic, neurologic) regarding physiotherapy services.
4. Identify practically applied physiotherapy services related to certain diseases.
5. Reveal the differences between age and gender in utilization indicators in case of traumatology, orthopaedic an neurological diseases.

3. MATERIALS AND METHOD

The basis of our examination was the analysis of a database of the National Health Insurance Fund Administration (NIFHA). These data were sent by the institutions providing outpatient care through the National Institute for Strategic Health Research (ESKI) and the Healthcare Episode Database (TEA). Case numbers within outpatient care in 2008 and 2009 were involved in the analysis.

The Hungarian version of the International Classification of Procedures in Medicine (ICPM / OENO) activity code list of physiotherapy-related activities was included in the rulebook on outpatient care of 2008 and 2009. Chapter J17 of this rulebook contains the list of *“Procedures provided by physiotherapists, therapeutic massagers, conductors and physiotherapy professionals”*, where 151 physiotherapy-related interventions were fixed in the examined period.

Points of the outpatient care activities in the examined years were considered on the basis of the prime list operative from the 1st of January.

Concerning query according to pathographies the selection of diseases based on the International Classification of Diseases (ICD/BNO) codes. Total annual case numbers of ICPM/OENO codes and the total amount of ICPM/OENO codes in the case numbers of ICD/BNO main blocks may differ. ICD rates were higher in all cases which resulted from the fact that more ICD codes were given at each attendance occasions.

Health insurance costs were calculated with 1.46 HUF/point applied actually in 2008 in cases of outpatient care. Health insurance costs in 2009 were accounted on the basis of the annual average HUF/point degree of performance volume limit (PVL) and preannounced performance-based fee (PPBF). In 2009 this rate in outpatient care was 1,27 HUF/point.

Data about the age and gender of annual case and patient numbers were provided by the Hungarian Central Statistical Office (HCSO) database from 1 January 2009. Query of age happened with the determination of five years period; results were calculated viewing 10.000 population.

4. RESULTS

4.1. The annual case number of the 151 physiotherapy activities was 24.748.877 in 2008, which meant 28.943.680 cases in the query according to the ICD main blocks (Table 1). The total financing by the National Health Insurance Fund Administration of physiotherapy activities were 7.339.446.299 HUF in 2008. Among the 20 most frequent activities there were instrumental activities with great case numbers, such as ultrasound therapy, iontophoresis, middle frequency treatment, etc. There is also a great case number of non-instrumental mechano- and kinesio therapies like muscle strengthening exercises, individual training, physiotherapy for circulation improvement, hand massage, passive movement, etc.

ICD codes	ICD main chapters	TOTAL 151 OENO case numbers	%	1 – 20 most frequent OENO case numbers	%	21 – 151 OENO case numbers	%
M00-M99	Diseases of the musculoskeletal system and connective tissues	17.579.700	60,74	13.407.785	76,27	4.171.915	23,73
S00-T98	Injury, poisoning and certain other consequences of external causes	3.038.612	10,5	2.406.316	79,19	632.296	20,81
V01-Y98	External causes of morbidity and mortality	1.819.266	6,29	1.432.778	78,76	386.488	21,24
I00-I99	Diseases of the circulatory system	1.418.585	4,9	919.512	64,82	499.073	35,18
G00-G99	Diseases of the nervous system	1.193.806	4,12	718.552	60,19	475.254	39,81
J00-J99	Diseases of the respiratory system	822.675	2,84	227.516	27,66	595.159	72,34
E00-E90	Endocrine, nutritional and metabolic diseases	531.585	1,84	277.059	52,12	254.526	47,88
Z00-Z99	Factors influencing health status and contact with health services	404.791	1,4	276.923	68,41	127.868	31,59
H00-H59	Diseases of the eye and adnexa	331.919	1,15	303.012	91,29	28.907	8,71
R00-R99	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	298.905	1,03	173.831	58,16	125.074	41,84
F00-F99	Mental and behavioural disorders	294.902	1,02	120.645	40,91	174.257	59,09
L00-L99	Diseases of the skin and subcutaneous tissue	242.831	0,84	62.630	25,79	180.201	74,21
Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities	225.129	0,78	147.132	65,35	77.997	34,65
C00-D48	Neoplasms	205.145	0,71	97.817	47,68	107.328	52,32
K00-K93	Diseases of the digestive system	124.731	0,43	67.368	54,01	57.363	45,99
H60-H95	Diseases of the ear and mastoid process	114.596	0,4	67.316	58,74	47.280	41,26
P00-P96	Certain conditions originating in the perinatal period	104.945	0,36	49.073	46,76	55.872	53,24
N00-N99	Diseases of the genitourinary system	72.731	0,25	45.621	62,73	27.110	37,27
A00-B99	Certain infections and parasitic diseases	57.107	0,2	20.501	35,9	36.606	64,1
D50-D89	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	32.292	0,11	14.656	45,39	17.636	54,61
O00-O99	Pregnancy, childbirth and puerperium	29.427	0,1	12.885	43,79	16.542	56,21
Total OENO case number according to ICD division		28.943.680	100,0	20.848.928	72,03	8.094.752	27,97
Total annual OENO case number		24.748.877		17.958.097		6.790.780	

Table 1

Case numbers of physiotherapy related activities and its percentage distribution in the division of ICD blocks

4.2. Trauma injuries account for 3.471.657 cases, showing an approximately 10,5% prevalence in the annual case number of physiotherapy featured activities which is 32.318.413 cases.

Annual case number of extremity injuries is the greatest, while torso, neck and head injuries are the smallest. Most cases treated in the region of the “*Injuries to knee and lower leg*” with 794.326 cases (22.88%), followed by the region of the upper extremities.

The 20 most commonly used activities out of 151 shows 86.35% incidence with a varied content.

The total number of trauma injury cases per 10.000 capita is 3.309,43. With the increase of age, per 10.000 capita physiotherapy procedure is on the rise.

Concerning gender, there is no significant difference between the mean rates in both genders (female=3272.54, male=3349.70). Until 49 years of age for men, and over 50 years of age for women the number of injury-related cases is greater. (Figure 1)

At diseases included in the ICD S00-S99 blocks, the cost of case numbers is 900.822.477 HUF which is 10,53% of the total expenditures, similarly to the percentage of traumatology diseases measured by the case number in all diseases (10,52%).

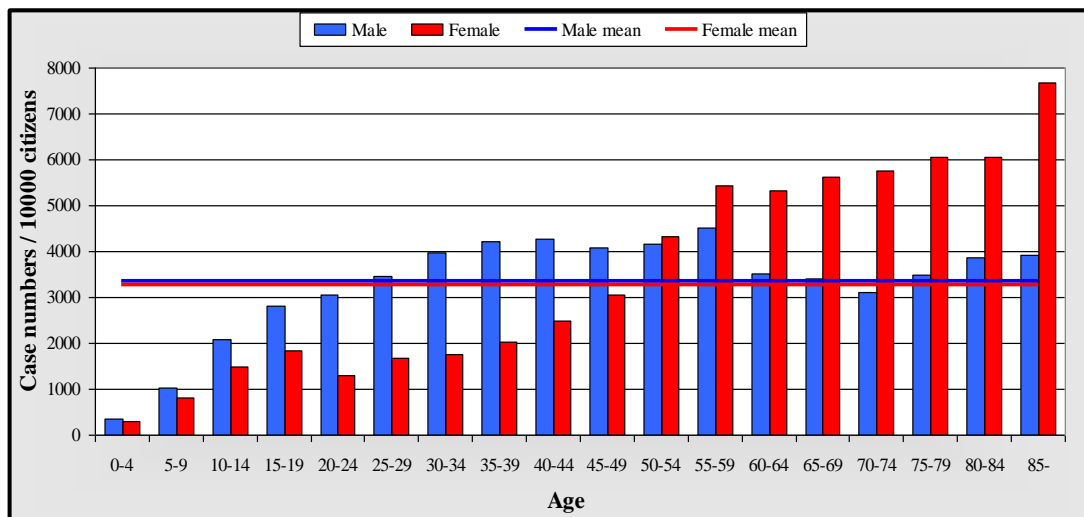


Figure 1
Physiotherapy featured activity case numbers per 10.000 capita concerning age and gender in case of trauma injuries in outpatient care (2009)

4.3. “Injuries to knee and lower leg” (S80-S89) may be considered as the most frequently treated area from the 10 regions of body injuries. with 794.326 (22,88%) case numbers. Further numbers of the lower extremities region in the “Injuries to hip and thigh” group (S70-S79) 353.260 (10,18%), while “Injuries to the ankle and foot” group (S90-S99) 276.403 (7,96%) cases.

In 2009 the average number of physiotherapy activities following lower limb injuries per 10.000 capita in case of “Injuries to hip and thigh” was 351,91, “Injuries to knee and lower leg” was 791,6, “Injuries to ankle and foot” was 275,33.

According to gender the average numbers per 10.000 capita in case of male and female patients were “Injuries to hip and thigh” 249,75 and 443,7; “Injuries to knee and lower leg” 927,64 and 668,25 (Figure 2), “Injuries to ankle and foot” 307,58 and 245,75. Regarding lower extremities according to all the three regions it can be considered that within the age group of 15-49 the number of men, while in elder age groups the degree of women would be higher. Utilization indicators of women regarding “Injuries to hip and thigh” shows that the number of female patients is higher than male patients in the age group of 65-69, “Injuries to knee and lower leg” it is considerable in the age group of 50-54, while in case of “Injuries to ankle and foot” this is relevant in the group of 55-59 years.

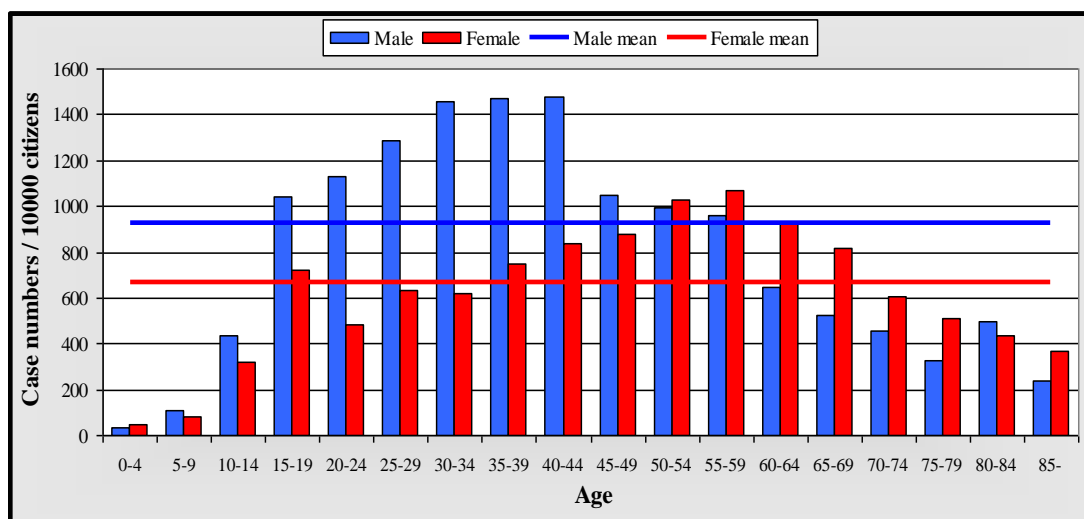


Figure 2
Physiotherapy featured activity case numbers per 10.000 capita concerning age and gender in case of knee and lower leg injuries in outpatient care (2009)

4.4. From the annual number of physiotherapy featured activities (32.318.413) the 19.095.614 cases of the musculoskeletal and connective tissue diseases shows 59,09% prevalence, the annual expenditure of which is approximately 4,5 billion HUF.

The 20 most frequently applied interventions shows a high, 79,19% prevalence (Table 2).

Nr.	Activity	Point	Case number	Case nr. percentage	Cost (HUF)	Cost percentage
1.	Ultrasound therapy	253	2.078.331	10,88	670.363.847	14,66
2.	Iontophoresis	186	1.550.829	8,12	367.749.597	8,04
3.	Middle frequency treatment	117	965.010	5,05	143.943.820	3,15
4.	Hand massage	153	962.373	5,04	187.719.854	4,11
5.	Muscle strengthening exercise	87	943.113	4,94	104.606.418	2,29
6.	Passive movement of multiple limb	203	901.975	4,72	233.434.954	5,11
7.	Diadynamic-interference treatment	61	718.130	3,76	55.848.081	1,22
8.	Exercises against resistance	149	688.528	3,61	130.792.615	2,86
9.	Mobilization of spine	173	674.482	3,53	148.761.934	3,25
10.	Mobilization of joints	149	645.970	3,38	122.708.307	2,68
11.	Training for circulation improvement	303	607.802	3,18	234.790.273	5,13
12.	Extension of contracture	247	571.969	3,00	180.112.889	3,94
13.	Magneto therapy	68	565.793	2,96	49.050.318	1,07
14.	Individual training	256	539.439	2,82	176.058.766	3,85
15.	Ergo therapy, preparation for home, guidance	342	529.178	2,77	230.729.558	5,05
16.	TENS	121	518.191	2,71	79.937.504	1,75
17.	Gymnastics	153	431.964	2,26	84.258.618	1,84
18.	Individual training on body parts	119	427.610	2,24	64.873.923	1,42
19.	Group training	135	417.848	2,19	71.916.318	1,57
20.	Passive movement on one body area	149	383.656	2,01	72.879.202	1,59
1- 20 most frequent activities:			15.122.191	79,19	3.410.536.798	74,59
21- 151 frequent activities:			3.973.423	20,81	1.161.985.679	25,41
151 activities in total:			19.095.614	100,00	4.572.522.477	100,00

Table 2

The number and cost of the 20 most frequent physiotherapy featured activities concerning the diseases of the musculoskeletal system and connective tissues (M00– M99) group in outpatient care (2009)

The average physiotherapy activity number of the most frequent disease groups in case of dorsopathy was 12.015, this number was 6.308 in case of arthropathy, and in soft tissue disorders 3.461 case/10.000 population.

According to age the average number for male and female groups were 8.061 and 15.589 in dorsopathies, 4.110 and 8.295 in arthropathies and 2.593 and 4.245 cases in soft tissue disorders.

4.5. The annual number of patients in 2009 examined upon the ICD main blocks was 6.570.068 in cases of documented physiotherapy treatment in outpatient care. Based on physiotherapy treatments 190.986 (2,91%) neurology patients attended at outpatient care from the group “*Diseases of the nervous system*” (G00-G99) pathographies. With regard to the case numbers in 2009 the 1.331.675 cases of “*Diseases of the nervous system*” based on the total annual case numbers of ICD main group (32.318.413) is 4,12% prevalence. In 2009 388,215million HUF health insurance reimbursement was resorted because of neurology complaints.

Concerning numbers per capita the main block “*Diseases of the nervous system*” with 6,97 cases/number of patients shows the highest rate. Case numbers over 10 per capita in the examined subgroups draws attention to aftercare in the “*Cerebral palsy and other paralytic syndromes*” (G80-G83) subgroup. (Table 3)

From the subgroups of the “*Diseases of the nervous system*” main block number of patients and cases show the highest rates in the “*Nerve, nerve root and plexus disorders*” (G50-G59) subgroup, and it is followed by the “*Cerebral palsy and other paralytic syndromes*” (G80-G83), and “*Episodic and paroxysmal disorders*” (G40-G47) subgroups. The average patient number rate of “*Nerve, nerve root and plexus disorders*” subgroup in case of men is 39 patient/10.000 population, and 66 patient/10.000 population in the group of women. The case number of “*Cerebral palsy and other paralytic syndromes*” in the male group is 49 patient/10.000 population, while in the female group it is 35 patient/10.000 population. Annual number of “*Episodic and paroxysmal disorders*” per 10.000 population is 33 in case of men, 52 in women.

Age group	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-	Mean
<i>“Nerve, nerve root and plexus disorders” (G50-G59)</i>																			
Male	12,79	13,53	11,05	8,81	11,85	9,65	10,51	9,27	9,84	8,55	8,66	8,51	8,77	9,91	9,92	8,43	8,02	9,10	9,35
Female	12,98	11,08	12,65	10,67	9,33	8,83	8,52	7,58	7,47	7,03	6,48	6,82	7,49	8,03	7,82	7,70	8,03	9,35	7,50
<i>“Cerebral palsy and other paralytic syndromes” (G80-G83)</i>																			
Male	11,88	10,13	13,85	13,59	16,29	12,07	13,48	8,62	9,67	10,73	8,32	8,99	10,88	8,83	9,48	9,35	8,65	9,41	10,35
Female	11,50	10,63	12,97	14,52	17,42	10,83	11,19	8,34	8,04	9,21	8,06	8,44	9,90	8,85	11,53	9,73	11,10	10,22	10,36
<i>“Episodic and paroxysmal disorders” (G40-G47)</i>																			
Male	5,29	4,65	7,23	5,14	3,42	3,77	4,10	3,56	3,53	3,59	3,58	3,83	4,29	4,65	4,59	4,35	4,77	4,57	4,39
Female	5,54	6,19	4,45	3,83	3,12	3,56	3,84	4,04	4,10	3,91	3,66	3,97	4,77	4,48	4,94	4,81	5,15	5,17	4,43

Table 3
Case number per patient in the most frequent ICD subgroups in neurological diseases concerning age based on the physiotherapy featured procedures in outpatient care in 2009 (rates over the average are highlighted)

5. DISCUSSION

Medical aspects and certain utilization indicators of health care system realizing in outpatient care have been already documented, however regarding nursing and rehabilitation procedures after medical care domestic literature is poorish. The aim of our study is to map the rehabilitation procedures of patients attending at outpatient care and the determination of utilization indicators from the aspect of physiotherapy services.

Case numbers of financed physiotherapy featured activities in outpatient care in the division of the 21 main groups of ICD code system of diseases showed a significantly high prevalence incidence in case of "*Diseases of the musculoskeletal system and connective tissues*" main group both in 2008 and 2009. Thus, ICD case numbers strengthen the fact that the application of physiotherapy activities is essential mainly in the treatment of locomotor diseases. In outpatient care these pathographies are also the most wide spread, the application of these physiotherapy activities are prevailed where it is confirmed with international studies. The total NHIFA financing of "*Procedures provided by physiotherapists, therapeutic massagers, conductors and physiotherapy professionals*" was 7,3 billion HUF in 2008, and 8,5 billion HUF in 2009. Query results of the main groups and aimed ICD codes discover the differences between the utilization indicators of professional fields, age and gender regarding documented physiotherapy featured activities in outpatient care. It can be determined in the scope of age division in case of trauma injuries among the Hungarian population that case numbers are increasing with the increase of age; however the difference of average rates concerning gender is not significant. Division by age and gender discovers the fact that until the age of 49 the number of cases is higher in the male group while over 50 years it is higher in the female group. In the age groups of the genders a higher case number may be supposed in the background of case number differences, which is able to correlate with physical activity and free time activities in case of men and the exist of osteoporosis concerning women. The increase of the utilization of physiotherapy services among women between the age of 55-60 can be seen in parallel with the increase of fractures caused by osteoporosis. The highest utilization at outpatient services were in case of knee and lower leg injuries among those suffered from trauma injuries, although for patients with upper extremity injuries outpatient services are more available by the reason of their better mobility.

In Hungary the number of physiotherapy interventions is increasing continuously with the increase of age according to the "*Diseases of musculoskeletal system and connective tissues*", utilization indicators are higher in elder ages. Changes of utilization accompanying the increase of age can be equally considered in the most frequent subgroups – "*Dorsopathies*",

“Soft tissue disorders”, “Arthropathies”. Based on the data of WHO in pathographies examined by them in 5 years period the prevalence of diseases are increasing in parallel with aging.

Within the main group *“Diseases of the musculoskeletal system and connective tissues”* *“Dorsopathies”* subgroup shows the highest occurrence with 51,17%. The annual case number means 37% from the total annual case number, highlighting that approximately every third of the physiotherapy activities in outpatient care trend towards the treatment of back problems. In case of a Brazil study about physiotherapy utilizations among adults the 34,8% incidence of spine problem treatments shows similar results than in Hungary.

Average rate of women cases high exceeds the rate regarding men at the examined pathographies. In case of the treatment of *“Soft tissue disorders”* the case number of women exceeds the sesquialter, while in case of *“Dorsopathies”* and *“Arthropathies”* the rate of men is duplicated. Frequency diagram of case numbers representing the population is primarily determined by the higher case numbers of the female group, especially in elder groups with higher case numbers. In younger age groups utilization is almost similar both among men and women. Disaggregation of gender rates can be seen from the age of 40 in case of *“Arthropathies”*, and continuously from 10-14 years according to *“Soft tissue disorders”*. *“Dorsopathies”* group shows a significant difference in gender since 10-14 years. More prevalent attendance of women at ambulatory physiotherapy treatment is confirmed by other researches.

High case numbers of the *“Diseases of the musculoskeletal system and connective tissues”* main group resulted high financing costs in outpatient service in 2009. With the foreseeable increase of degenerative locomotor diseases these expenditures are expected to rise, which urges the introduction of preventive programs and analysis of effectiveness projected on pathographies to manage the existing public health problem.

Treatment of neurological outpatients in our country is known in point of 2009. From the results of Bereczki and Ajtay it can be determined that quasi 43% of neurology outpatients attend at physiotherapy care. Within the main group of *“Diseases of the nervous system”* the highest rates concerning case and patient numbers were found in the subgroups of *“Nerve, nerve root and plexus disorders”* (G50-G59), *“Cerebral palsy and other paralytic disorders”* (G80-G83) and *“Episodic and paroxysmal disorders”* (G40-G47).

However, case numbers over 10 per patient attracts attention to aftercare in the subgroups *“Systemic atrophies primarily affecting the central nervous system”* (G10-G13), *“Cerebral palsy and other paralytic syndromes”* (G80-G83).

Higher utilization indicators of women can be observed in the *“Nerve, nerve root and plexus disorders”* and *“Episodic and paroxysmal disorders”* subgroups from the three most frequent

subgroups according to the case numbers of outpatient service, while regarding “*Cerebral palsy and other paralytic syndromes*” group the utilization indicators of men are higher. With regard to the slight references of physiotherapy on the field of neurological care and rehabilitation, the result of our work can be compared with epidemiologic results of pathographies concerning the adequate ICD subgroups.

The European prevalence of epilepsy concerning “*Episodic and paroxysmal disorders*” subgroup can be parallel with our patient numbers, where the highest rate is considered in elder ages, followed by young ages and the smallest incidence occurs in adulthood. Higher case numbers in childhood is confirmed by the high presence of epilepsy as well as the incidence and prevalence of the disease in elder ages. International literature be concerned with migraine and cephalagia publish higher occurrence in women, which difference is not considerable in younger ages. Appearance of diseases in turn characterizes the adulthood most.

In “*Cerebral palsy and other paralytic syndromes*” subgroup case numbers exceeding the average may be the result of Cerebral Paresis in childhood, hemiplegia in elder ages, which is mostly caused by stroke in case of men.

Considering the case numbers of the groups, incidence between genders can be characterized similarly. Disaggregation of male and female groups can be considered from the age of 40. Higher occurrence of neurological diseases in younger age groups is perceivable, however according to pathographies in “*Cerebral palsy and other paralytic syndromes*” group both number of patients and cases show rates exceeding the average. Case numbers per patient show equally high rates in the younger age groups in case of all the three disease groups.

6. NOVEL FINDINGS, PRACTICAL APPLICATION

Results demonstrated in this study include several novel findings and practical application possibilities which were summarized according to the following:

Novel findings:

1. Annual health insurance expenditures of ambulant physiotherapy activities financed by NIFHA were defined.
2. Utilization indicators of physiotherapy outpatient care reimbursed by the NIFHA were mapped.
3. Annual NIFHA financing rate and utilization indicators concerning the most frequent diseases (traumatology, orthopaedic, neurologic) with regard to physiotherapy services were determined.
4. Practically applied physiotherapy services related to certain pathographies were identified.
5. Differences between age and gender in utilization indicators were demonstrated in case of traumatology, orthopaedic and neurological diseases.

Practical application:

1. By means of our analysis the annual health insurance expenditures of ambulatory physiotherapy activities financed by the NIFHA became traceable.
2. Regarding physiotherapy services in case of more frequent pathographies (traumatology, orthopaedic, neurologic) physiotherapy activities became identifiable thus these can be followed-up.
3. In case of traumatology, orthopaedic and neurological diseases the differences between physiotherapy services presented in professional guidelines / recommendations and those applied in everyday clinical practice became comparable.
4. Our analysis provides a methodological background for the improvement of quality assurance processes concerning physiotherapy services.