

## FINANCING OF THERAPEUTIC REHABILITATION IN THE CONTEXT OF OTHER NON-INVASIVE MEDICAL TREATMENT SPECIALTIES

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### ABSTRACT

**Introduction.** Methods of financing health care services constantly undergo changes. These changes involve both the allocated financial resources and average prices received for person-day of treating patients in hospital departments of various specialties. Thus, a constant monitoring of financing levels and service pricing in particular types of health care services is indispensable, since these issues are directly associated with the development or stagnation observed in particular branches of medicine.

**Aim.** This paper aimed at verifying the hypothesis that the pricing of person-day in the field of inpatient therapeutic rehabilitation, especially involving children, is under priced in relation to an average value of a person-day received in specialties providing non-invasive hospital treatment, and comparable as regards the costs of services.

**Materials and methods.** An analysis and comparison of costs and incomes for medical units providing health care services in selected areas of inpatient therapeutic rehabilitation for children and non-invasive hospital medical treatment have been attempted. This analysis has been carried out on the basis of data provided by the regional branches of the National Health Fund (NFZ). Generally available information concerning the terms and conditions of contracting services and agreements that NFZ has entered into with service providers has been also used.

**Results and discussion.** A comparison of the conditions for providing services that service providers should meet in order to obtain financing within the framework of NFZ, shows that personnel costs of a department of pulmonary rehabilitation and department of general rehabilitation are lower by approximately 15% than

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personnel costs of a department of pediatrics, and 9% lower than for a department of pediatric neurology. However, an average pricing of person-day received by rehabilitation departments is about 3-fold lower than that received by departments of pediatrics and pediatric neurology. Departments providing non-invasive medical treatment admit a large variety of patients. This diversification of patients only in part coincides with patients admitted to rehabilitation departments. Thus, additionally average pricings of person-day at departments providing non-invasive medical treatment and departments of general rehabilitation with respect to selected diagnosis related groups of patients who manifest diseases treated in both types of departments, have been compared. The obtained results have confirmed gross under financing of inpatient rehabilitative services.

**Conclusions.** Inpatient rehabilitative services offered for children are particularly undervalued. In this instance, service providers bear higher costs, resulting from, among other considerations, a larger average number of physiotherapists necessary to conduct rehabilitation, the requirement of assuming the full legal responsibility for children which necessitates additional educational care and 24-hours medical care, not only in the case of neurological rehabilitation, as well as providing nutrition adequate for children's ages, including five high-quality meals daily. Consequently, it is necessary to increase the pricing of inpatient rehabilitative services provided for children.

**Key words:** therapeutic rehabilitation, pricing of health care services, cost comparison, income per person-day

## INTRODUCTION

Health care is a very strongly regulated sector. Practically all organizations involved in this branch are subject to a multi-dimensional state control embracing: prices, number of provided services, quality, investments, and a possibility of entering the medical market [5]. The functioning of various spheres of health care depends on governmental policies and institutions appointed by the government to control this sector. The pricing of particular types of health care services is especially important, since this directly affects the financial standing of medical centers and the development or stagnation of specific medical specialties. It appears that recently inpatient therapeutic rehabilitation has been grossly under financed, when compared with the costs of providing such services as well as in relation to other spheres of medical practice. The price of rehabilitation services offered for children is particularly undervalued.

### Characteristics of financing health care services in Poland

The National Health Fund (Pol. Narodowy Fundusz Zdrowia – NFZ) is responsible for carrying out the analysis of health care services costs (Act of August 27, 2004, concerning health care services financed from public resources – Article 97, paragraph 3, item 1). However, neither the principles according to which such an analysis is carried out, nor its outcomes, nor even the very fact of performing it, are announced for public opinion. With the shortage of clear and transparent principles as regards the pricing of health care services, lobbying and political interests are strongly voiced, based, among others, on a subjective selection of particular diseases deemed socially trying and thus requiring allocating more financial resources to treating them. On the other hand, it should be clearly stated that despite the availability of many methods allowing for evaluating unit costs of particular health care services [4], a comparison of cost adequacy in particular types of services is not straightforward. This difficulty is caused, among other considerations, by the fact that each type of service is financed according to a different system. Basic health care is financed within a capitated framework, specialist outpatient care – per provided consultation, hospital treatment – within the framework of the diagnosis related groups (DRG) system, and inpatient therapeutic rehabilitation – per person-day and within the DRG system.

Such a diversification of reimbursement systems is justified by a need to create separate stimuli and incentives for particular types of services. Yet, it makes it difficult to compare the financial standing regarding specific types of service providers. A fundamental principle of an effective pricing of services is that costs should be reimbursed in a way similar to the way in which they have been incurred [1]. A public payer is to create such a system of reimbursement for health care services that it would maximize social benefits stemming from the system of health care [2].

In the NFZ financial plan, therapeutic rehabilitation stands as a separate unit and about 3% of public financial resources for health care services are allocated to it. In 2009, 1.78 billion zlotys was spent on rehabilitation, and the financial plan for the year 2010 (as of July 31, 2010) allocated 1.65 billion zlotys. Therapeutic rehabilitation embraces the following types: inpatient rehabilitation (general, neurological, pulmonary, cardiac), rehabilitation in a day center/ department (general, for children with disturbances associated with developmental age, cardiac, pulmonary with the use of techniques of subterranotherapy), outpatient rehabilitation care provided by physicians (physicians' consultations), outpatient physiotherapy, home physiotherapy, speech and hearing therapy, and vision rehabilitation. Inpatient rehabilitation, except for neurological and cardiac rehabilitation, rehabilitation in a day center/ department, speech and hearing therapy, and vision rehabilitation are financed on the basis of a person-day, calculated as a product of the point value of a given service, established in the instruction of the NFZ Chairman, divided by price per point "negotiated" by a service provider with a NFZ regional branch. Since October, 2010,

neurological and cardiac rehabilitation, just like those departments included within the NFZ budget category of “hospital treatment”, have been financed within the DRG system. Outpatient rehabilitation care provided by physicians is financed per consultation, whereas outpatient physiotherapy and home physiotherapy are financed according to performed procedures [9].

Each of the enumerated types of rehabilitation and hospital treatment requires specific equipment, premises, and personnel. These requirements are determined by the Regulation of the Minister of Health dated August 30, 2009, concerning guaranteed rehabilitation services and by the Instruction of the NFZ Chairman dated October 29, 2009. With respect to the professional and sanitary requirements as regards premises and equipment in a health care institution, inpatient rehabilitation departments must meet identical criteria as other departments providing non-invasive medical treatment.

### **Diversification of outlays for rehabilitation provided for children and adults**

The NFZ does not differentiate between the financing of rehabilitation services as regards both children and adults. However, there are differences both with respect to diseases treated, education, number and type of personnel in particular departments, applied therapeutic methods, and conditions that services providers must create in order to ensure a proper rehabilitation process. In the case of pediatric rehabilitation departments the most frequently treated diseases include congenital defects, such as cerebral palsy or motor organ dysfunctions (e.g., spinal curvatures). In the case of adults, post-traumatic, post-stroke and cardiac rehabilitation are most frequent.

Inpatient rehabilitation offered for children generates higher costs than for adults. Because additionally, it is necessary to:

- employ, on average, a larger number of physiotherapists required for conducting rehabilitation – due to a broader scope of individual rehabilitation procedures. Some procedures, which in the case of adults can be performed in groups, must be carried out individually with small children (it is hard to imagine an 8-person group of young children who do rehabilitative exercises effectively). Extra time is also necessary so that children can become accustomed to specific procedures and equipment, etc.;
- assume the full legal responsibility for children, which necessitates additional educational care (hospital schools financed by the Ministry of Education provide such care only partially);
- introduce 24-hours medical care on location, not only in the case of neurological rehabilitation (on-call duty is out of the question due to the fast pace of changes occurring in children’s health conditions);
- provide nutrition adequate for children’s ages, including five high-quality meals daily. Inpatient rehabilitation is a process lasting several weeks and frequently

requires significant physical effort. Moreover, in Poland, rehabilitation centers are located relatively far from each other, and consequently often positioned away from children's places of residence. This makes it impossible for parents to visit their children frequently and to bring meals for them.

### **AIM**

This paper aims at verifying the hypothesis that the pricing of person-day in the field of inpatient therapeutic rehabilitation, especially involving children, is under priced in relation to an average value of a person-day received for specialties providing non-invasive hospital treatment, and comparable as regards costs of services.

### **MATERIALS AND METHODS**

In order to verify the above formulated hypothesis, various sources of data have been used. The share of particular types of rehabilitation in the total budget allocated to these types of services has been established on the basis of the NFZ Financial Plan dated July 31, 2010, as well as the reference book concerning contracts entered by particular regional branches of the NFZ [3].

Data necessary for comparing the financing of inpatient therapeutic rehabilitation and selected hospital departments providing non-invasive medical treatment have been obtained from questionnaires sent to all 16 regional branches of NFZ. The questionnaires consisted of questions concerning:

- average cost of person-day of hospital treatment, specifying particular types of treatment, and covering the first half of 2010 (only completed hospitalizations, conducted within the period from January, 2010 to June 30, 2010); completed questionnaires were returned by 3 NFZ regional branches;
- contracts for the year 2010 involving inpatient rehabilitation (general, neurological, pulmonary, cardiac);
- average number of hospital treatment days in the first half of 2010 at departments providing non-invasive medical treatment with respect to patients paid for within selected groups of the DRG system, involving diseases treated both within the framework of non-invasive hospital treatment and inpatient general rehabilitation [10], where the need for applying ICD-9 procedures does not exist; completed questionnaires were returned by 5 NFZ regional branches.

Conditions required for providing health care services in particular medical specialties have been established on the basis of the requirements for particular types of services specified in appropriate instructions of the NFZ Chairman [11–17].

## RESULTS AND DISCUSSIONS

About 40% of the financial resources allocated to therapeutic rehabilitation is spent on inpatient rehabilitation (Tab. 1), the remaining amount covers the expenses incurred by rehabilitation in day centers/ departments, as well as outpatient and home rehabilitation. In inpatient rehabilitation, general and neurological rehabilitation have the biggest share – almost 90%. The pricing of services is diversified. The lowest average prices per point were received by service providers with regards to neurological rehabilitation, and the highest by those associated with cardiac and pulmonary rehabilitation. The prices range from 0.75–1.50 zlotys per point.

**Tab. 1.** NFZ budget allocation for therapeutic rehabilitation and average pricing per point in particular types of inpatient rehabilitation

Service type	Total amount for contracted services	Share in therapeutic rehabilitation [%]	Share in inpatient rehabilitation [%]	Weighted average price per point [zlotys]	Point price min.–max. [zlotys]
Cardiac rehabilitation	66 649 017	4.0	10.4	1.21	1.00–1.36
Neurological rehabilitation	178 036 633	10.8	27.7	1.09	0.75–1.50
General rehabilitation	378 370 796	22.9	58.8	1.12	0.90–1.40
Pulmonary rehabilitation	20 187 695	1.2	3.1	1.22	1.00–1.40
<b>TOTAL – Inpatient rehabilitation</b>	<b>643 244 141</b>	<b>38.9</b>	<b>100.0</b>	<b>1.12</b>	<b>0.75–1.50</b>
Other types of services – outpatient	1 011 564 859	61.1	–	–	–
<b>TOTAL – Therapeutic rehabilitation</b>	<b>1 654 809 000</b>	<b>100.0</b>	–	–	–

Source: NFZ financial plan dated July 31, 2010 [3].

Tab. 2 presents the NFZ requirements for the year 2011 concerning inpatient rehabilitation and selected departments providing non-invasive medical treatment for children, which treat patients with a similar intensity of diseases. Additionally, for the sake of comparison, department of internal medicine and hospitalization involving hematology-oncology therapy of children have been included. Oncology and hematology belong to cost-incurring specialties because of the applied diagnostics and pharmacotherapy. However, in the case of hospitalization involving hematology-oncology therapy, oncological diagnostics is most frequently performed earlier, and administered medication (active substances) are paid for separately [11, 19]. Thus, the intensity of therapeutic activities and resulting costs can be compared with other

**Tab. 2.** Comparison of minimal requirements specified by the NFZ for the year 2011 regarding personnel employed by health services providers in selected medical specialties

Category	Department of Pediatric Rehabilitation				Hematology-oncology hospital treatment for children <sup>1</sup>	Department of		
	general	pulmonary	cardiac	neurological		Pediatric	Pediatric Neurology <sup>2</sup>	Internal Medicine
Number of beds	35	35	35	35	35	35	35	35
Required number of full-time employees:								
- physician - specialist	1.5	1.5	2.75	2.50	3.0	3	2.0	3
- nurse <sup>3</sup>	14.0	14.0	14.00	16.00	18.0	18	18.0	14
- physiotherapist	3.5	3.5	3.50	5.80	-	-	0.5	-
- child care taker	5.0	5.0	5.00	5.00	5.0	5	5.0	-
- psychologist	-	-	1.00	1.75	0.5	-	-	-
- occupational therapist	-	-	-	1.75	-	-	-	-
- dietitian	-	-	1.00	-	-	-	-	-
- speech therapist	-	-	-	1.00	-	-	-	-
Total - Personnel	24	24	27.25	33.80	26.5	26	25.5	17
Requirements concerning 24-hour medical care	Ensuring physician's care in the afternoon, in the evening, at night - at a nurse's request				Ensuring 24-hour physician's care (can be combined with other non-invasive medical treatment)			
Additional conditions	Stand for intensive medical supervision on location				Beds allocated for intensive medical care - entry in the Register of Health Care Institutions: section III, column 9			

On the basis of instructions issued by the NFZ Chairman [7-9, 12-17]. Comments: <sup>1</sup> Conditions identical with those specified for departments of pediatric hematology and pediatric oncology. <sup>2</sup> Minimal number of physicians employed full-time at the department of pediatric neurology is 2: "in the case of treating children the equivalent of at least 2 FTE (full-time employment) (does not apply to physician's duty), including the equivalent of at least 1 FTE specialist in pediatric neurology, including head of hospital department (physician in charge of the department) - specialist in pediatric neurology" [7]. <sup>3</sup> The number of nurses is consistent with the Regulation of the Minister of Health dated December 21, 1999, concerning establishing minimal norms regarding the employment of nurses and midwives in health care institutions (Dz.U. z 1999 Nr 111, poz 1314 [Journal of Laws No 111, item 1314]).

departments providing non-invasive medical treatment. The analysis has been carried out for departments having 35 beds, since for many years the Regulation of the Minister of Health concerning the professional and sanitary requirements for premises and equipment of a health care institution included the following instruction: "A nursing section cannot exceed 35 beds". This requirement was omitted in the amendment of November 10, 2006. Nevertheless, many departments are still organized according to that original directive.

The data included in Tab. 2 show that requirements concerning the nursing personnel of rehabilitation departments are similar to those of hospital departments providing non-invasive medical treatment. They mostly concern providing 24-hour care per 7 days a week. Requirements differ with respect to the number of physicians. In rehabilitation departments this number increases as the number of beds grows, while in hospital departments this number is unchanged irrespective of the number of beds. Yet, the major differentiating factor is the necessity of employing physiotherapists in rehabilitation departments. In the case of pediatric departments, child care providers have been included as well, although they are not specified in the NFZ requirements. Their presence is, however, necessary and in practice they are employed in those departments to look after underage patients.

As regards the number of employed personnel, a department of neurological rehabilitation definitely stands out. Apart from a larger number of physiotherapists, additionally psychologists, occupational therapists and speech therapists must be employed there.

In all compared departments providing non-invasive medical treatment and departments of neurological and cardiac rehabilitation a physician on duty is required. This duty can be combined with other departments. Such a requirement has not been established for departments of general rehabilitation and departments of pulmonary rehabilitation. However, in the case of pediatric departments, the constant presence of a physician on location is necessary for safety reasons, because children are frequently unable to describe their health conditions adequately and precisely. A nurse may wrongly assess a child's condition and not provide him with adequate help.

Monthly labor costs in the departments have been calculated as a product of gross monthly salary divided by the required number of full-time employees according to the NFZ for the year 2011 (Tab. 3). In order to visualize the differences better, it has been assumed that the cost of department of pediatrics amounts to 100%. The obtained data show that the personnel costs at the department of neurological rehabilitation are higher by 23% than personnel costs at the department of pediatrics and are comparable to the costs at the department of cardiac rehabilitation. Personnel costs at departments of general rehabilitation and pulmonary rehabilitation are lower by 15% than such costs at the department of pediatrics. Among departments providing non-invasive medical treatment, the lowest personnel costs are incurred by the department of internal medicine. Since this department treats adults, it does not need to employ child care takers.

**Tab. 3.** Monthly costs of personnel gross wages, employed according to requirements specified by the NFZ (see Tab. 2), and average incomes of rehabilitation departments and selected hospital departments providing non-invasive medical treatment

Category	Gross salary per FTE [zlotys] <sup>1</sup>	Monthly costs of personnel gross wages at departments [zlotys]									
		Department of pediatric rehabilitation				Hematology-Oncology Hospitalization of children	Department of			Internal medicine	
		General	Pulmonary	Cardiac	Neurological		Pediatric neurology	Pediatric rheumatology	Pediatric medicine		
Physicians – specialists	6 000	9 000	9 000	16 500	15 000	18 000	18 000	12 000	18 000	18 000	18 000
Nurses	3 000	42 000	42 000	42 000	48 000	54 000	54 000	54 000	54 000	54 000	42 000
Physiotherapists	2 600	9 100	9 100	9 100	15 167	–	–	1 300	–	–	–
Child care takers	2 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	–
Psychologists	3 000	–	–	3 000	5 250	1 500	–	–	–	–	–
Occupational therapists	2 500	–	–	–	4 375	–	–	–	–	–	–
Dietitians	2 500	–	–	2 500	–	–	–	–	–	–	–
Speech therapists	2 800	–	–	–	2 800	–	–	–	–	–	–
<b>Total monthly labor costs in the department</b>		<b>70 100</b>	<b>70 100</b>	<b>83 100</b>	<b>100 592</b>	<b>83 500</b>	<b>82 000</b>	<b>77 300</b>	<b>82 000</b>	<b>82 000</b>	<b>60 000</b>
Comparison of monthly personnel costs (in relation to the department of pediatrics – 100%)		85%	85%	101%	123%	102%	100%	94%	100%	100%	73%
Service value	–	110	90	100	300, 240 and 220 <sup>2</sup> 190, 150 and 120 <sup>3</sup>	15	–	–	–	–	–
Weighted average price per point	–	1.12	1.22	1.21	1.09	51	–	–	–	–	–
<b>Average value of person-day in 2010</b>	–	<b>123.20</b>	<b>109.80</b>	<b>147.22<sup>4</sup></b> <b>121.00<sup>5</sup></b>	<b>276.13<sup>6</sup></b> <b>167.13<sup>7</sup></b>	<b>765</b>	<b>418.88</b>	<b>387.14</b>	<b>411.58</b>	<b>411.58</b>	<b>330.31</b>
Comparison of average costs of person-day (in relation to the department of pediatrics – 100%)		29%	26%	29%	66% 43%	183%	100%	92%	98%	98%	79%

Source: Author's estimates. Comments: <sup>1</sup> Approximate gross wages of medical personnel have been obtained on the basis of interviews with hospital directors. For the sake of analysis clarity, wages have been rounded to an accuracy of 500 zlotys. <sup>2</sup> Within the framework of the DRG system, in neurological rehabilitation (NR), 3 groups have been established with the following point values: RND01 – 300 points, RND02 – 240 points, RND03 – 220 points. <sup>3</sup> According to the requirements for year 2010, NR was priced within three different services provided: person-day in early NR – 150 points, NR in severe damage to CNS – 190 points, and secondary NR – 120 points. <sup>4</sup> Hypothetical price of person-day in cardiac rehabilitation, (CR), which can be obtained by service providers within the DRG system framework in 2011. The price has been calculated as a product of an arithmetical average of 3 DRG groups (RK01 – 160 points, RK02 – 115 points, RK03 – 90 points) divided by the average price per point in CR in 2010. <sup>5</sup> Average price of person-day in NR, which can be obtained by service providers within the DRG system framework in 2011. The price has been calculated as a product of an arithmetical average of 3 DRG groups (RND01 – 300 points, RND02 – 240 points, RND03 – 220 points) divided by the average price per point in NR in 2010. <sup>6</sup> Average price of person-day in NR in the first half of 2010 (before introducing the DRG system), calculated on the basis of data obtained from the NFZ.

Incomes of departments of general rehabilitation and pulmonary rehabilitation have been calculated as a product of the service value determined for the years 2010 and 2011 (service value has not changed in relation to 2010) [8] divided by the weighted average of the price per point in 2010. In the case of neurological rehabilitation and cardiac rehabilitation, due to significant changes in the financing scheme introduced as of October 2010, involving a switch to the DRG system and increasing the service value, two income values per person-day have been presented:

- real income obtained in the first half of 2010: 180.81 zlotys for neurological rehabilitation (on the basis of the questionnaires from the NFZ regional branches) and 121.00 zlotys in the case of cardiac rehabilitation,
- hypothetical income possible to achieve in 2011, assuming an unchanged price per point: 276.13 zlotys in neurological rehabilitation and 147.22 zlotys in the case of cardiac rehabilitation. Point value has been calculated as an arithmetic mean of the DRG pricing for children: RND01, RND02 and RND03 [9], i.e.,

$$\frac{300+240+220}{3} \cdot 1.09 = 276.13 \text{ zlotys}$$

Income per person-day in hematology-oncology inpatient treatment of children has been calculated as a product of price per point in hospital treatment divided by service value [7]. Hospital treatment functions within the DRG reimbursement system, thus it is not possible to calculate income per person-day directly. Consequently, the average value of a person-day in the remaining analyzed departments providing non-invasive medical treatment has been calculated on the basis of the data obtained from the NFZ regional branches.

The comparison indicates that there are vast disproportions in pricing the services offered by inpatient general rehabilitation and pulmonary rehabilitation in relation to departments providing non-invasive medical treatment. On average, income per person-day in general rehabilitation (123.20 zlotys), and pulmonary rehabilitation (109.80 zlotys) is more than 3-fold lower than income per person-day obtained in departments providing non-invasive medical treatment, whereas personnel costs are lower only by 15%. The situation regarding neurological rehabilitation is equally unsatisfactory. The price of person-day estimated for 2011 (276.13 zlotys), despite a higher personnel cost (by 23%), and considering a new pricing for services within the DRG system, is still lower by 34% than an average price per person-day at the department of pediatrics (418.88 zlotys).

Departments providing non-invasive medical treatment admit a large variety of patients. This diversification of patients only in part coincides with patients admitted to rehabilitation departments. Thus, in order to make this analysis reliable, additionally average prices of person-day received at departments providing non-invasive

medical treatment and departments of general rehabilitation with respect to selected diagnosis related groups of patients who manifest diseases treated in both types of departments, have been compared. The value of person-day has been calculated as a quotient of an average hospitalization period of patients in a particular group in a particular department multiplied by the pricing for the respective group (Tab. 4). This calculation also shows that the price per person-day in inpatient general rehabilitation (123.20 zlotys) is almost 3-fold lower than an average price per person-day of treatment obtained at departments providing non-invasive medical treatment, being respectively: 340.54, 366.09, and 425.84 zlotys.

**Tab. 4.** Average hospital stay length of patients and associated average value of person-day in selected DRG groups from January to June, 2010 (only ICD-10 applicable to general rehabilitation)

Group code	Department of			Point value – hospital stay	Group pricing	Department of			
	Neurology (pediatric)	Internal medicine	Pediatrics			Neurology (pediatric)	Internal medicine	Pediatrics	
	Average hospital stay length [days]					Average value of person-day [zlotys]			
[1]	[2]	[3]	[4]	[5]	[6]=[5]×51 zlotys	[6]/[2]	[6]/[3]	[6]/[4]	
A31	6.9	5.5	8.5	30	1 530	223	276	180	
A32	9.0	13.6	5.1	60	3 060	340	225	600	
A36	7.5	–	14.5	70	3 570	474	–	246	
A57	12.9	5.7	14.0	77	3 927	304	695	281	
A87	5.0	6.8	3.9	31	1 581	317	233	408	
D19	–	9.4	14.3	70	3 570	–	381	251	
H56	8.8	5.9	3.8	30	1 530	173	261	402	
H87	16.6	7.5	5.4	68	3 468	209	460	647	
H89	5.2	5.4	3.6	42	2 142	415	397	588	
P05	–	–	7.8	95	4 845	–	–	620	
P14	–	–	2.3	24	1 224	–	–	521	
P16	2.9	–	5.5	35	1 785	610	–	326	
P20	–	–	4.5	41	2 091	–	–	467	
Average length of hospital stay	8.3	7.5	7.2	Average price of person-day DRG for 5 NFZ regional branches <sup>1</sup>			340.54	366.09	425.84
				Average price of person-day for 3 NFZ regional branches <sup>2</sup>			411.58	330.31	418.88

Source: Average prices of person-day have been calculated as a quotient of group pricing multiplied by the average length of hospitalization of patients (Tab. 1). Group pricing has been calculated as a product of group point value – hospitalization, specified in Appendix No 1 to Instruction No 51/2010/DSOZ of the NFZ

Chairman and the point price in year 2010 – 51 zlotys. Comments: <sup>1</sup> Average value of person-day in selected DRG groups (alike in departments providing non-invasive medical treatment and inpatient general rehabilitation departments). <sup>2</sup> Average price of person-day calculated on the basis of average prices of person-day obtained by selected hospital departments in 3 NFZ regional branches which returned the questionnaires. Abbreviations: A31 – peripheral nerve disorders; A32 – muscle disorders; A36 – demyelinating disorders; A57 – inflammatory diseases of the central nervous system; A87 – other diseases of the nervous system; D19 – bronchodilation; H56 – spinal pain syndromes; H87 – inflammatory diseases of joints and connective tissue; H89 – non-inflammatory diseases of bones and joints; P05 – major infections (including immune system diseases); P14 – post-traumatic injuries, except brain injuries; P16 – serious genetic diseases and other congenital disorders; P20 – skin diseases, musculoskeletal diseases and connective tissue diseases.

### How did such a drastic disproportion in the pricing of non-invasive medical services provided in hospitals and inpatient rehabilitation services come about?

In 2005, the difference between the income per person-day between inpatient rehabilitation departments and departments providing non-invasive medical treatment was 2-fold (respectively, about 97 zlotys and about 250 zlotys). In 2006, a new Act came into force [6], which provided for a 30% increase in the financial resources allocated for salaries in medical institutions. In hospital treatment and therapeutic rehabilitation, the legislators assumed the share of labor cost in the service cost at the level of 65%, and on this basis prices per person-day were calculated (Tab. 5, line 3). In 2008, the NFZ introduced into hospital treatment a new system of reimbursement based on the DRG system. This allowed for a significant increase in the average price of hospitalization. Data provided by the NFZ indicate that in the year 2009 an average price of hospitalization in all types of hospital treatment was higher by about 40% in relation to 2007, whereas as concerns inpatient rehabilitation, the price of hospitalization increased only by about 5% (Tab. 5, line 5).

**Tab. 5.** History of changing the price of person-day for departments providing non-invasive medical treatment and rehabilitation departments

Year	Price of person-day		Difference in the price of person-day	Change dynamics concerning the price of person-day
	Departments of pediatrics and pediatric neurology	Departments of general rehabilitation and pulmonary rehabilitation		
2005	250 zlotys	97 zlotys	153 zlotys	39%
2006	120% <sup>1</sup>	120% <sup>1</sup>		
2007	299 zlotys	116 zlotys	183 zlotys	39%
2008	140% <sup>2</sup>	105% <sup>3</sup>		
2009	418 zlotys	122 zlotys	297 zlotys	29%

Source: Author's analysis. Comments: <sup>1</sup> Increase of the outlays resulting from the Act concerning transferring financial resources to service providers for the purpose of increasing salaries [6]. <sup>2</sup> Increase of the outlays resulting from the implementation of the DRG system in hospital treatment. <sup>3</sup> Increase of the outlays resulting from negotiating higher rates by service providers.

Apart from the low pricing of rehabilitative services already in 2005, changes in the health care financing system – adverse for this specialty – have only deepened the already existing disproportions, increasing by almost 2-fold the difference between average prices per person-day in those comparable types of services (from 155 zlotys to 297 zlotys).

## CONCLUSIONS

This presented data show that medical personnel labor costs are generally comparable in rehabilitation departments and departments providing non-invasive medical treatment. Also, the requirements concerning a physician on duty do not differ significantly. The analysis carried out clearly indicates that the pricing of inpatient general rehabilitation and pulmonary rehabilitation is grossly undervalued in relation to the pricing of services offered by departments providing non-invasive medical treatment.

Such a disproportion is particularly unfavorable for inpatient pediatric rehabilitation, where the difference between the financing level and incurred costs is the largest.

Permanent underfinancing of inpatient rehabilitation, resulting from the low pricing of services, leads to eliminating or limiting the number of beds in hospital rehabilitation departments, as is exemplified by limiting the number of beds in Children's Health Institute in Warsaw by 36% (from 70 to 45 beds). Moreover, under-waged medical personnel search for employment at other departments. This, in a long-term perspective, will lead to a permanent lowering of the quality of rehabilitative services and their availability in Poland.

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9. Załącznik nr 1r do Zarządzenia Nr 53/2010/DSOZ Prezesa Narodowego Funduszu Zdrowia z dnia 2 września 2010 r. w sprawie określenia warunków zawierania i realizacji umów w rodzaju rehabilitacja lecznicza [Appendix No 1r to Instruction No 53/2010/DSOZ of the National Health Fund Chairman of September 2, 2010, concerning determining the terms and conditions of contracts and their realization as regards: therapeutic rehabilitation].
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