

# TREATMENT COSTS OF PARKINSON'S DISEASE IN CENTRAL EUROPE

***Petra Marešová, Blanka Klímová, Martin Vališ, Kamil Kuča, Hana Mohelská***

## Introduction

Parkinson's disease (PD) is a serious disease and economic and social problems of present times. It is caused by the loss of dopamine-producing neurons and by the accumulation of a protein into Lewy bodies in neurons in the area of midbrain, in the so-called pars compacta substantia nigra. In fact, before this disease breaks out, there is a loss of 60-80% of dopaminergic neurons (Farlow et al., 2013). There is thus a relatively long period of time preceding the actual manifestation of motor symptoms at which point a substantial proportion of dopaminergic cells has been already lost with no movement-related issues being evident. Therefore, a detailed neurological and laboratory examination of patients suffering from impaired olfaction and sleep disturbances would bring a significant benefit to PD diagnosis in its early stage. The first symptoms of this disease comprise overall tremor, particularly in hands, slowness of movement, rigidity of limbs, and balance difficulties (Ransmayr, 2015).

Sometimes these symptoms are described by acronyms TRAP (Tremor, Rigidity, Aknesis and Posture instability) (Yorkston, Beukelman, Strand, & Bell, 1999). These key motor symptoms are also called Parkinsonism or a parkinsonian syndrome. In addition, besides the motor symptoms, in the course of the development of PD patients might acquire other disorders known as non-motor symptom complex which includes cognitive difficulties and dementia; neuropsychiatric symptoms such as depression, anxiety, hallucinations or apathy; autonomic symptoms such as low blood pressure, constipation, difficulties in swallowing, increased sweating or sexual dysfunction; sleep disorders; or loss of smell.

This disease mostly affects older people (60+). According to the study of 2012, about 4.1-4.6 million people suffered from PD

worldwide (Dorsey et al., 2007). Currently, almost 6.3 million of people are affected by this disease (European Parkinson's Disease Association, 2015). More than one million of the Europeans has it and there are forecasts that by 2030 a number of patients will double. Despite the fact that the impact of Parkinson's disease on present society is enormous, many people are not well informed about this disease.

Experts warn against the increasing frequency of Parkinson's disease with the person's growing age. This increase is quite obvious until person is 75 years old. After that, the increase is not that much striking (European Parkinson's Disease Association, 2015). An average age of the onset of the disease is around 57 years. That is why Parkinson's disease is considered to be an aging disease (Drummond & O'Brien, 1997). Out of the whole population older than 60 years, 1% of people suffer from this disease ("Všeobecná Zdravotní Pojišťovna [General Health Insurance Company]," 2015). As many as 10% of patients fall ill before they are 40. This is an early onset of the disease (young onset type). In this case, the calendar age is not important, but it is the biological age of an individual, which is influenced by his genetics. Another 10% fall ill after they are 75, which is a late onset of the disease (late onset type) (Růžička, Roth, & Kaňovský, 2000).

From the point of view of public systems of many countries in Europe, it can be said that care about people with dementia is done in mutually separated sectors. A part of this care is provided by healthcare system, as in the case of other mental health diseases the majority of the cost of disease are not born in the healthcare system (Dlouhý, & Barták, 2013) and part by social services. A specific interface of these systems in form of long-term social health care has not been established yet despite many attempts (Barták & Gavurová, 2014; Gavurová

& Vagašová, 2016). A substantial portion of services is still provided informally by family members and other caregivers in households. This area has not been much researched yet (Šoltés & Gavurová, 2014). A smaller part is then a subject of commercial interest within the so-called grey economy.

There are only few specific data on the issue of dementia and associated costs which are publically available. Therefore, it is very difficult to draw a specific picture of financial burden on the systems in European countries. The purpose of this article is thus to provide more detailed information about the current value of the direct costs of the treatment and care about patients with PD. They are calculated not only on the basis of aggregated data from the publically available sources, but also on the basis on authors' own survey.

## **1. Methodology**

In this study Drummond's methodology (Drummond & O'Brien, 1997) is used for the specification of costs. In this methodology the costs are divided into two categories – direct and indirect costs. This study is focused on the direct costs, especially costs of outpatient and inpatient care, costs of drugs. The data were collected on the basis of guided interviews run by head of the Department of Neurology. Partial data on outpatient and inpatient care are specified. The data for the costs of drugs are based on (Winter et al., 2010) and they are included in the final amount in conclusion so that there could be an opportunity to compare the direct costs with other EU countries.

510 with patients participated in this study in the period of 2011-to the third quarter of 2015. The data were collected at the University Hospital in Hradec Kralove in the Czech Republic as one of the countries of Central Europe. The study focuses on the following parameters: length of hospitalization, price of hospitalization, number and types of outpatient examinations. The data are sorted and values of descriptive statistics are specified such as average, maximum minimum, mean, deviation.

The results refer to the diagnoses according to the International Statistical Classification of Diseases and Related Health Problems. The attention is focused on Parkinson's disease dementia (G20+). 510 in the category G20 are included. Secondary Parkinsonism (G21) and Parkinsonism in diseases filed elsewhere (G22)

are not analysed. For category G21 only the numbers of patients are described, for category G22 no patients are in University of Hospital in analysed period.

## **2. Treatment Costs of Parkinson's Disease in Central Europe – a Czech Cohort Study**

In the Czech Republic the total number of patients with PD is estimated at 16,000 people. The incidence, however, gradually increases with age and in the age categories at 65 years it affects 1-2% of population. The General Health Insurance Company (GHIC), which covers costs of most patients in the Czech Republic, reported in 2014 almost 16,000 patients with PD. Their treatment reached nearly 14,782,966 EUR (CZK/EURO – exchange rate is based on data from the European Central Bank accessed 14th March, 2016).

The biggest financial share is formed by the costs of commonly used prescribed drugs within the outpatient care (more than 52%). Almost 10% is then created by the costs of Duodopa (“Všeobecná Zdravotní Pojišťovna [General Health Insurance Company],” 2015). The costs of drugs per patient for the Czech Republic were specified in (Winter et al., 2010) and it is 1,220 EUR, which is also considered in this study and included in the total amount of direct costs.

### **2.1 Characteristics of Patients**

Table 1 presents numbers of patients, who were registered at the University Hospital of Hradec Kralove in the monitored period with individual diagnosis and numbers of outpatient examinations. Attention is only paid to the patients in category G20, whose number is 510.

### **2.2 Costs of Outpatient Care**

One of the items of the direct costs are the costs of outpatient care. This study involves the costs of individual visits such as a visit at the neurologist, blood collection, CT head or body native and contrastive screening as it is presented in Table 2.

The visits at the neurologist can be twice a year, but according to the patient's state also three-four times a year. The calculation of the costs is based on a model example of two special examinations by a neurologist per year, one complex examination by a neurologist, one

**Tab. 1: Total number of examinations and patients with dg. G20, G21 (outpatient department)**

Outpatient care	Diagnosis					
	G20			G21		
Year	Number of patients	Number of outpatient examinations	Average examination per patient	Number of patients	Number of outpatient examinations	Average examination per patient
2011	136	371	2.73	3	4	1.33
2012	99	301	3.04	4	7	1.75
2013	99	258	2.61	5	7	1.40
2014	89	202	2.27	7	11	1.57
1.-9./2015	87	191	2.20	4	9	2.25
<b>Total</b>	<b>510</b>	<b>1,323</b>	<b>2.59</b>	<b>23</b>	<b>38</b>	<b>1.65</b>

Sources: University Hospital of Hradec Kralove (2015) and authors' own calculations

**Tab. 2: Costs of outpatient care**

Examination	Type	EUR
1st visit at the neurologist	Complex	24.91 €
	Special	5.34 €
2nd and every other visit at the neurologist	Targeted	12.63 €
	Special	5.34 €
	Followed person	0.38 €
Blood collection, twice a year	Only if indicated by a doctor	1.37 €
CT head or body native and contrastive screening	Only if indicated by a doctor	94.37 €
<b>Total</b>		<b>144.34 €</b>

Sources: University Hospital of Hradec Kralove (2015) and authors' own calculations

targeted examination by a neurologist, blood collections twice a year, CT head screening once a year. The total final amount is 144 EUR. Additional costs include the costs of drugs (modified according to (Winter et al., 2010) at average amount of 1,220 EUR per year. The total annual costs of outpatient treatment are 1,364 EUR.

### 2.3 Costs of Inpatient Care

The number of patients in relation to the length of hospitalisation and costs are described in Table 3.

The costs and the length of hospitalization are significantly influenced by the fact whether the patient spent some time at the Intensive Care Unit (ICU) or not. The costs without the stay at ICU and with the stay at ICU are presented in Table 4.

The days of hospitalization and the costs of hospitalization for individual years and all the patients with standard deviation are described in Table 5.

The costs of inpatient care range in the individual years between 407 and 1,239 EUR on average per patient. Then, the **total direct**

**Tab. 3: Days and costs of hospitalization**

Days of hospitalization	Number of patients	Costs of hospitalization (EUR)	Number of patients
less than 1 week	39	less than 400	38
to 2 weeks	56	to 700	64
to 3 weeks	13	to 1,700	8
more than 4 weeks	6	more than 1,700	4

Sources: University Hospital of Hradec Kralove (2015) and authors' own calculations

**Tab. 4: Costs with respect to the stay at ICU**

Year	Number of days	Total cost (EUR)	Average costs per day (EUR)
2011	146	7,018.9	48.1
2012*	122	5,784.6	47.4
2013*	260	12,115.1	46.6
2014*	354	15,923.4	45.0
1.-9./2015	199	9,200.4	46.2
<b>Total*</b>	1,081	50,042.5	46.3

\*These data do not include the patients who had to be hospitalized at ICU.

Patients hospitalized at ICU			
Year	Number of days (ICU)	Total cost (ICU) (EUR)	Average cost per day (ICU) (EUR)
2012	33	12,812.2	371.0
2013	14	4,770.6	294.2
2014	15	3,967.6	219.5
<b>Total</b>	62	21,550.4	317.0

Sources: University Hospital of Hradec Kralove (2015) and authors' own calculations

**costs of patient** per year may be modelled on the basis of the following relationship:

- Average outpatient care per patient + Drugs + Average inpatient care per patient,
- Thus = 144 + 1,220 + 686 = 2,032 €.

Not every patient has to be hospitalized during the year, but the hospitalization at ICU significantly influences the costs and it does not have to be directly connected with Alzheimer's

disease. In that case the costs could be lowered by 686 EUR (CZK/EUR – exchange rate is based on data from the European Central Bank accessed 14th March, 2016).

### 3. Discussion

Within this study the outpatient and inpatient costs of PD in Central European country – Czech Republic were monitored. The authors

**Tab. 5: Overview of the costs of inpatient establishments in the period of 2011-2015, diagnosis G20**

Hospitalization		The days of hospitalization			Costs of hospitalization (EUR)		
Year		M	±	SD	M	±	SD
2011	(n = 15)	8.47	±	3.62	406.6	±	161.3
	Range	1 day	—	14 days	59.7	—	657.0
2012	(n = 15)	11.1	±	5.76	1,239.8	±	2,321.3
	Range	3 days	—	28 days	177.1	—	9,021.7
2013	(n = 26)	11.07	±	6.19	649.5	±	865.6
	Range	1 day	—	28 days	60.1	—	4,770.6
2014	(n = 34)	11.29	±	7	585.0	±	521.0
	Range	3 days	—	40 days	156.4	—	311.6
1.-9./2015	(n = 20)	9.95	±	5.717	460.0	±	234.1
	Range	3 days	—	24 days	145.4	—	1,024.6
Total	(n = 110)	10.59	±	6.02	642.5	±	1,011.4
	Range	1 day	—	40 days	59.7	—	9,021.7

Sources: University Hospital of Hradec Kralove (2015) and authors' own calculations

**Tab. 6: Comparison of the selected direct costs**

Costs of PD in Czech Republic in 2008, source: (von Campenhausen et al., 2011), in EUR		Own study – costs of PD in the Czech republic in 2011-2015, in EUR	
Hospitalization per one patient/per day	70	Hospitalization	51.8
GP (2x) and Neurologist (2x)	14 + 24 = 38	Neurologist four times a year	49
<b>Total</b>	<b>108</b>		<b>100.7</b>

Source: authors

researched the direct costs among 510 patients at the University Hospital of Hradec Kralove were explored in the period of 2011- to the first quarter of 2015. They included neurological examination, CT screening, blood collection, hospitalization, and drugs. The total costs reached a value of 2,032 EUR.

According to (von Campenhausen et al., 2011), the total costs per patient in the Czech Republic were monitored. If only the amounts comparable with this survey are selected, it is possible to observe almost the identical costs of prices of examination and hospitalization per patient (Tab. 6).

Furthermore, within a comparison with other foreign studies (Andlin-Sobocki, Jönsson, Wittchen, & Olesen, 2005), (Spotte et al., 2005), (Hagell, Nordling, Reimer, Grabowski, & Persson, 2002), (Findley et al., 2003) the length of hospitalization can be discussed. For example, an average length of the stay of the hospitalized patients ranged between eight days in Austria to 19 days in Germany during the six-month observation (von Campenhausen et al., 2011). In the Czech Republic it is about 10 days. The costs connected with the hospitalized patients (including the hospitalization and rehabilitation) differed in the selected

**Tab. 7: Total treatment costs in the selected European countries**

Country	Direct costs per one year per one patient	Direct costs (Inpatient care, Outpatient care and drugs) (19% of direct costs)
Total costs	EUR	EUR
Czech Republic	6,700 (Winter et al., 2010)	1,273
Italy	5,004 (von Campenhausen et al., 2011)	950
Germany	8,160 (Spottke et al., 2005)	1,635
Austria	5,892 (von Campenhausen et al., 2011)	1,119
Sweden	7,920 (Hagell et al., 2002)	1,504
United Kingdom	9,500 (Findley et al., 2003)	1,805
Czech Republic (this survey)	x	2,032

Source: authors

countries from 100 EUR to 1,600 EUR. In the Czech Republic the costs connected with hospitalization are about 700 EUR. Thus, one can see that the costs of hospitalization as well as its length in the Czech Republic are average.

Table 7 compares the costs of the selected direct costs in the selected European countries: Inpatient care +Outpatient care + drugs. The amounts of the direct costs from other studies are calculated on the basis of (Andlin-Sobocki et al., 2005), where direct costs -the individual items are as follows: 41% home care, 11% drugs, 3% hospitalized care, other direct costs 5%. Thus, this study considers 19% of the total costs (without home care).

These costs from all studies are converted into the period of 12 months with respect to the possibility of their comparison with other studies.

As Table 7 above shows, the highest direct costs per patient per year are definitely in the United Kingdom, followed by Germany and Sweden. On the contrary, the lowest direct costs per patient are in Italy and Austria. The Czech Republic again stands somewhere in the middle. As far as the selected direct costs (inpatient care, outpatient care and drugs) are concerned, the Czech Republic on the basis of this study comes first, followed by the United Kingdom and Germany. Italy again comes last. The results of this study is particularly influenced by the costs on inpatient care, including the stays at ICU, which significantly affect the

prices. In other studies this specific information on the types of hospitalization is not included. In case of lowering the data by hospitalization variable, the costs in the Czech Republic would reach 1,364 EUR, which would rank the Czech Republic after Germany (Tab. 7).

The survey showed that the underpinning of patients with PD was beneficial from the costs point of view because the costs on the outpatient care were much lower in comparison with the inpatient care. In addition, patients released from the hospital are usually transferred to the establishments with subsequent care, for example into hospices, because family care due to its complexity is impossible. In the individual regions of the Czech Republic there are substantial differences which would deserve detail research. Most of the patients has been recorded in Prague, south Moravia and central Bohemia. There are twofold or even threefold differences in the provided health services among the individual regions (“Všeobecná Zdravotní Pojišťovna [General Health Insurance Company],” 2015). In the regions it is not possible to trace more significant connections and ties among the frequencies of individual types of services. Thus, one cannot argue that one form of service was compensated by another.

### Conclusions

The information stated above shows that the issue of the treatment costs of PD is not systematically solved, except perhaps an

individual treatment, but not within the framework of individual countries so that the data could be compared. In spite of the distortion of the data, it can be claimed that the treatment costs are rising. With respect to the aging population in Europe, these items will increasingly represent a bigger burden of health systems. Therefore, emphasis should be put on the unified strategy for their payment in individual countries. In addition, the authors of this study suggest that amount of healthcare services in all the country's regions (Maresova, Klimova, & Kuca, 2014). In addition, with respect to the rising treatment costs, more attention should be also paid to the alternative non-pharmacological therapies (Klimova & Kuca, 2015). Furthermore, international comparisons on the volume of provided care must be considered very carefully. These comparisons are usually based on expert estimation and they are not supported by reliable data (Maresova, Mohelska, Dolejs, & Kuca, 2015). Even a more complicated comparison among the other EU countries is in the area of social care (Klimova, Maresova, Valis, Hort, & Kuca, 2015) because in social services in comparison with healthcare, there is no regular disclosure of information, which would deal with the issue of dementia.

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## References

- Andlin-Sobocki, P., Jönsson, B., Wittchen, H.-U., & Olesen, J. (2005). Cost of disorders of the brain in Europe. *European Journal of Neurology*, 12 Suppl 1, 1-27. doi:10.1111/j.1468-1331.2005.01202.x.
- Barták, M., & Gavurová, B. (2014). Economics and social aspects of long-term care in the context of the Czech Republic and the Slovak Republic EU membership. In *Proceedings of 12th International scientific conference: Economic Policy in the European Union member countries, PTS I and II*. (Vol. 2015, pp. 35-44). Ostravice, Czech Republic.
- Dlouhý, M., & Barták, M. (2013). Mental Health Financing in Six Eastern European Countries. *E&M Ekonomie a Management*, 16(4), 4-13.
- Dorsey, E. R., Constantinescu, R., Thompson, J. P., Biglan, K. M., Holloway, R. G., Kieburtz, K., Tanner, C. M. (2007). Projected number of people with Parkinson disease in the most populous nations, 2005 through 2030. *Neurology*, 68(5), 384-386. doi:10.1212/01.wnl.0000247740.47667.03.
- Drummond, M. F., & O'Brien, B. J. (1997). *Methods for the Economic Evaluation of Health Care Programs* (2nd ed.). Oxford Medical Publication.
- European Parkinson's Disease Association. (2015). *About Parkinson's*. Retrieved July 8, 2015, from <http://www.epda.eu.com/en/pd-info/about-parkinsons/>.
- Farlow, M. R., Schmitt, F., Aarsland, D., Grossberg, G. T., Somogyi, M., & Meng, X. (2013). Comparing Clinical Profiles in Alzheimer's Disease and Parkinson's Disease Dementia. *Dementia and Geriatric Cognitive Disorders Extra*, 3(1), 281-290. doi:10.1159/000351861.
- Findley, L., Aujla, M., Bain, P. G., Baker, M., Beech, C., Bowman, C., Playfer, J. R. (2003). Direct economic impact of Parkinson's disease: A research survey in the United Kingdom. *Movement Disorders*, 18(10), 1139-1145. doi:10.1002/mds.10507.
- Gavurová, B., Vagašová, T. (2016). Regional differences of standardised mortality rates for ischemic heart diseases in the Slovak Republic for the period 1996-2013 in the context of income inequality. *Health Economics Review*, 6(21). doi:10.1186/s13561-016-0099-1.
- Hagell, P., Nordling, S., Reimer, J., Grabowski, M., & Persson, U. (2002). Resource use and costs in a Swedish cohort of patients with Parkinson's disease. *Movement Disorders*, 17(6), 1213-1220. doi:10.1002/mds.10262.
- Klimova, B., & Kuca, K. (2015). Alzheimer's disease: Potential preventive, non-invasive, intervention strategies in lowering the risk of cognitive decline – A review study. *Journal of Applied Biomedicine*, 13(4), 257-261. doi:10.1016/j.jab.2015.07.004.
- Klimova, B., Maresova, P., Valis, M., Hort, J., & Kuca, K. (2015). Alzheimer's disease and language impairments: social intervention and medical treatment. *Clinical Interventions in Aging*, 10, 1401-1408. doi:10.2147/CIA.S89714.
- Maresova, P., Klimova, B., & Kuca, K. (2014). Alzheimers disease: cost cuts call for novel drugs development and national strategy. *Ceska a Slovenska Farmacie*, 64(1-2), 25-30.

Maresova, P., Mohelska, H., Dolejs, J., & Kuca, K. (2015). Socio-economic Aspects of Alzheimer's Disease. *Current Alzheimer Research*, 12(9), 903-911.

Ransmayr, G. (2015). Cognitive impairment in Parkinson's disease. *Psychiatria Danubina*, 27(4), 458-461.

Růžička, E., Roth, J., & Kaňovský, P. (2000). *Parkinsonova nemoc a parkinsonské syndromy [Parkinson's disease and parkinsonian syndromes]*. Praha: Galén.

Spotkke, A. E., Reuter, M., Machat, O., Bornschein, B., Campenhausen, S. von, Berger, K., Dodel, D. R. (2005). Cost of illness and its predictors for Parkinson's disease in Germany. *PharmacoEconomics*, 23(8), 817-836. doi:10.2165/00019053-200523080-00007.

Šoltés, V., & Gavurová, B. (2014). The possibilities of day surgery system development within the health policy in Slovakia. *Health Economics Review*, 4(35). doi:10.1186/s13561-014-0035-1.

von Campenhausen, S., Winter, Y., Rodrigues e Silva, A., Sampaio, C., Ruzicka, E., Barone, P., Reese, J. P. (2011). Costs of illness and care in Parkinson's disease: an evaluation in six countries. *European Neuropsychopharmacology: The Journal of the European College of Neuropsychopharmacology*, 21(2), 180-191. doi:10.1016/j.euroneuro.2010.08.002.

Všeobecná Zdravotní Pojišťovna [General Health Insurance Company]. (2015). Retrieved September 8, 2015, from <https://www.vzp.cz/onas/aktuality/>.

Winter, Y., von Campenhausen, S., Brozova, H., Skoupa, J., Reese, J. P., Bötzel, K., Ruzicka, E. (2010). Costs of Parkinson's disease in Eastern Europe: A Czech cohort study. *Parkinsonism & Related Disorders*, 16(1), 51-56. doi:10.1016/j.parkreldis.2009.07.005.

Yorkston, K. M., Beukelman, D., Strand, E. A., & Bell, K. R. (1999). *Management of Motor Speech Disorders in Children and Adults* (2nd ed.). Austin, Tex: Pro ed.

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## Abstract

**TREATMENT COSTS OF PARKINSON'S DISEASE IN CENTRAL EUROPE****Petra Marešová, Blanka Klímová, Martin Vališ, Kamil Kuča, Hana Mohelská**

*The aim of the study is to describe current values of direct costs of Parkinson's disease in western and central Europe in comparison with other available data in order to illustrate the development of the treatment costs of Parkinson's disease (PD) on the public sector.*

*In this research study Drummond's methodology is used for the specification of costs. The costs are divided into two categories. The first category consists of the costs of creation and running of health care program and these costs are perceived as the used sources. The costs are calculated on the basis of the reviews of the studies from the European countries, but also on the basis of authors' own survey in the University Hospital of Hradec Kralove conducted among 510 patients in the period of 2011-to the third quarter of 2015.*

*Within this study the direct costs among 510 patients at the University Hospital of Hradec Kralove were explored in the period of 2011- to the third quarter of 2015. These costs included neurological examination, CT screening, blood collection, hospitalization, and drugs. The total direct costs of patient per year reached 2,032 EUR.*

*The survey showed that the underpinning of patients with PD was beneficial from the costs point of view because the costs on the outpatient care were much lower in comparison with the inpatient care. In addition, patients released from the hospital are usually transferred to the establishments with subsequent care, for example into hospices, because family care due to its complexity is impossible.*

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