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COMPARATIVE ANALYSIS OF DRG SYSTEMS IN THE EU COUNTRIES

Abstract: In Poland DRGsystem (JGP) has been introduced in 2008, the 1 July. The innovative type of financing is related to the health care services in hospitals. At the beginning JGP was based on British version of DRG – called HRG system. Afterwards the Polish version of HRG was changed many times and currently JGP system is an individual model within DRGsystems. Polish JGP system is based on: main diagnosis, comorbidities, age and sex.

For the first time DRGsystem put into the practice in the United States of America in 1983. The new idea of in-patients classification was invented at the Yale University and was related to the Medicare program. Nowadays DRG systems are obligatory in the most European countries.

The aim of the article is analysis effects of the innovative type of financing the health care services in hospitals. The article indicates main socio-economic problems, which are caused by introduction JGPsystem. DRGsystem is not functioning without mistakes, although it is the most innovative system of financing in-patients.

The main disadvantage of DRGsystem is resignation the holistic treatment to a chosen (the most expensive) diagnostic-therapeutic process.

Key words: financing the health care services, Diagnosis Related Groups, efficient management in the health care system

1. INTRODUCTION

The health care system is defined by the WHO as “all the activities aimed primarily at promoting, improving and maintaining good health of the population members”.

The societies of the EU countries recognize that health should be a benefit available to every member of the society regardless of their income.

Art. 129 of the Treaty on European Union of Maastricht signed in 1992 obliges all the Member States to “contribute towards ensuring a high level of human health protection”.

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The European directives on health protection in fact refer solely to the provisions on coordinating social security.

The coordination of the social security schemes is aimed at implementing such solutions which will ensure that a European citizen has access to benefits and at the same time prevent him or her from taking advantage of these benefits simultaneously in several countries.

The coordinating provisions do not interfere in the internal law of particular Member States as each state specifies on its own who is entitled to benefits and on what terms as well as defines the way of functioning of the services financing system.

The citizen of another Member State is entitled to take advantage of benefits in the country of stay on the same terms as the citizens of this country.

When modern health systems are designed one of the basic guidelines is to ensure long-term financial stability. The long-term time perspective is significant for a few reasons. On the one hand the demographic processes which have occurred in Europe over the last 50 years show that the average life expectancy of a European citizen has become longer. On the other hand, though, the advancement in medical technologies led to a rapid increase in the costs of health care in the 70s and 80s of the 20th century.

Due to the fact that the costs of hospital treatment account for the highest proportion of the total costs of treatment, the organization and the mode of financing inpatient care services constitutes a very significant issue, particularly in the countries where health care is financed from public funds.

The aim of this article is to analyse the organization and the mode of financing inpatient health care services and to make an attempt at evaluating the solutions implemented in Poland within the framework of the system of Homogeneous Groups of Patients (System Jednorodnych Grup Pacjentów) being one of many modifications of the Diagnosis Related Groups system which originated in the USA.

2. DEMOGRAPHIC ASPECTS

When analysing further life expectancy in the OECD countries in the last 50 years (1956–2006) it can be noted that the average life span in the Member States of the European Union lengthened by approximately 10 years in the analysed period. Poland underperforms against this background as the average life expectancy increased by approximately 7 years. This analysis confirms the existence of a commonly known relation indicating that men live shorter than women. In the European Union countries this difference in life span amounts to 6 years on average, whereas in Poland it accounts for almost 9 years. In Poland men live only 71 years on average, in contrast to the European Union countries

where the average life span for men amounts to 76 years. It can be noted that Polish women match European women in terms of age (the average life span for the European Union is 82 years and the average for Poland accounts for almost 80). In the case of men this difference is 5 years. Out of all the OECD countries Japanese and Spanish women are characterised by the longest life expectancy – 86 years and 84 years respectively. Men enjoy the longest life span in Switzerland – slightly over 79 years and in Japan – 79 years (See Table 1).

Table 1. Life expectancy. Total population at birth

Countries	LE 2006 females	Δ LE females 1956–2006	LE 2006 males	Δ LE males 1956–2006	Difference between LE f and LE m
	(1)	(2)	(3)	(4)	(5) = (1) – (3)
Austria	82.7	10.8	77.1	11.7	5.6
Belgium	82.3	8.8	76.6	8.9	5.7
Czech Republic	79.9	6.4	73.5	5.7	6.4
Finland	83.1	10.6	75.9	10.4	7.2
France	84.4	10.8	77.3	10.3	7.1
Germany	82.4	10.7	77.2	10.7	5.2
Greece	82	9.6	77.1	9.8	4.9
Hungary	77.4	7.3	69	3.1	8.4
Ireland	82.1	10.2	77.3	9.2	4.8
Italy	83.8	11.5	77.9	10.7	5.9
Japan	<u>85.8</u>	15.6	79	13.7	6.8
Korea	82.4	<u>28.7</u>	75.7	24.6	6.7
Norway	82.9	6.9	78.2	6.6	4.7
Poland	79.6	9.0	70.9	6.0	8.7
Portugal	82.3	15.7	75.5	14.5	6.8
Slovak Republic	78.2	5.5	70.4	2	7.8
Spain	<u>84.4</u>	12.2	77.7	10.3	6.7
Sweden	82.9	8.0	78.7	7.5	4.2
Switzerland	84.2	10.1	<u>79.2</u>	10.5	5.0
Turkey	74	23.7	69.1	22.8	4.9
United Kingdom	81.1	7.4	77.1	9.2	4.0
United States	80.4	7.3	75.2	8.6	5.2
Average for U.E.	82	10	76	9	6.0

Source: Own calculations based on OECD Health Data 2008 – Version: December 2008.

3. EXPENDINTURE ON HEALTH CARE SERVICES

The expenditure incurred on health care services constitutes a significant share of the Gross Domestic Product. The largest proportion of funds is allocated to health care in the USA. In 2008 this expenditure accounted for 16% of GDP. In comparison to the year 1976, i.e. over the period of 40 years, the expenditure on health care has increased by 8 percentage points.

When analyzing the expenditure on health care services per capita in 2008 it can be noted that one citizen accounted for 7538 US\$ in purchasing power parity and the increase over the period of 12 years amounted to 100% (in 1996 the said expenditure accounted for 3803 US\$ in purchasing power parity).

It should be taken into account that in the USA the provision of health care services to citizens does not constitute the responsibility of the state. Private funds account for the largest proportion of the total health care expenditure. It should be stressed that the majority of new medical technologies are developed in the USA.

Among the European Union Member States Germany's expenditure on health is the highest. In 2008 total health care expenditure amounted to almost 11% GDP where per capita expenditure amounted to 3737 US\$ in purchasing power parity.

In Poland the expenditure assigned to one citizen amounted to 7% GDP i.e. approximately 1213 US\$ in purchasing power parity.

The funds allocated to health care services in Poland are scarce in comparison to such countries as Germany or Sweden (See Table 2). However, according to the author of this paper, this is not the main reason for the malfunctioning of the health care system in Poland. When the payer does not have any economic knowledge on the costs of health care it is hard to determine how high the average outlay on one patent should be.

Table 2. Expenditure on health care services

1976	1986	1996	2006	2008
1	2	3	4	5
United States				
Total expenditure on health % gross domestic product				
8.1	10.2	13.2	15.3	16.0
Total expenditure on health, per capita, US\$ purchasing power parity				
670	1877	3803	6714	7538
Sweden				
Total expenditure on health % gross domestic product				
7.8	8.2	8.2	9.2	9.4
Total expenditure on health, per capita, US\$ purchasing power parity				
588	1292	1861	3202	3470

Table 2 (cont.)

1	2	3	4	5
Germany				
Total expenditure on health % gross domestic product				
8.4	8.7	10.4	10.6	10.5
Total expenditure on health, per capita, US\$ purchasing power parity				
638	1455	2399	3371	3737
Poland				
Total expenditure on health % gross domestic product				
		5.9	6.2	7.0
Total expenditure on health, per capita, US\$ purchasing power parity				
		478	910	1213

Source: Own calculations based on OECD Health Data 2008 – Version: December 2008.

4. SYSTEM OF HEALTH CARE ORGANIZATION

The organization of health care is a very complex issue and in fact every country has its own specific organizational system.

In historical terms health insurance schemes were the first to emerge (Germany 1833). Their functioning was based on a health insurance contribution. From these schemes evolved the funding of benefits in kind and cash benefits. The most common funding model as regards benefits in kind is based on one payer (such a scheme currently operates in Poland, Lithuania, Latvia or Hungary) or on several insurers (as exemplified in Germany, Austria, the Czech Republic or the Slovak Republic). The health insurance scheme which operates in France is based on financing cash benefits (Chart 1).

Another separate model of financing health care is the publicly funded system (the National Health Service model) which can operate either in the centralized form (Great Britain) or in the decentralized form (the Scandinavian countries, Italy, Portugal).

It should be emphasized that both the health insurance scheme and the publicly funded system are constantly evolving and still have not tackled the problem of balance between supply and demand for health care services under budget constraints. This phenomenon should be regarded as a natural consequence of advancements in technology which entail constantly increasing outlays on health care services and on improving the effectiveness of outlays allocation.

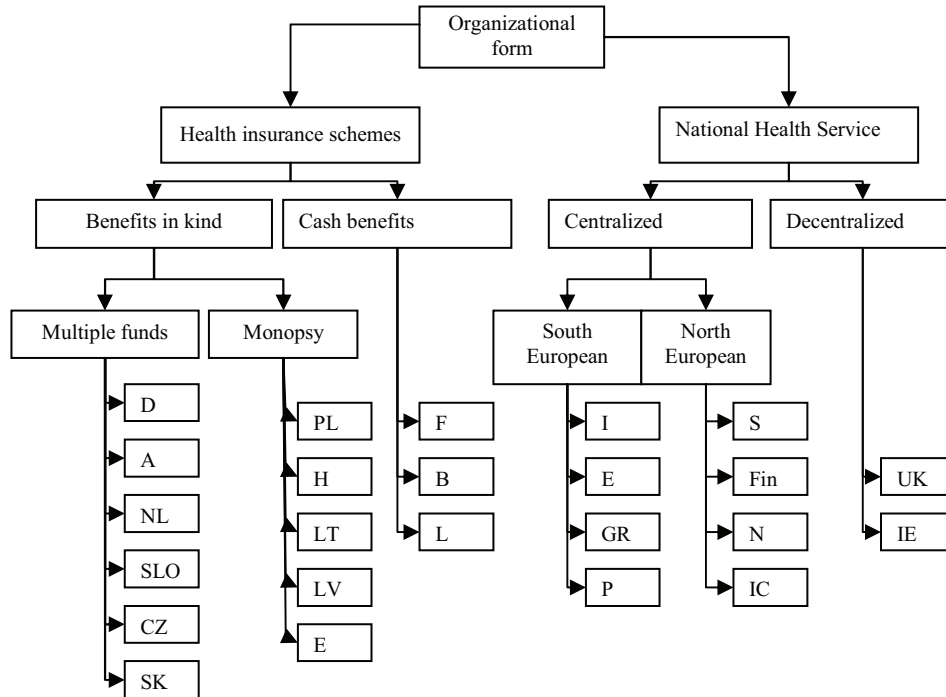


Chart 1. Types of health care systems in the EU countries and the EEA countries (to the exclusion of Cyprus and Malta)

Source: ed. A. Kozierkiewicz „Koło ratunkowe dla szpitali. Od doświadczeń do modelu”, p. 69, Termedia Publishing House.

5. ORGANIZATION OF IMPATIENT TREATMENT

Out of all outlays incurred on health care the expenditure on inpatient health care services constitute the most significant group of costs in the health care system. Moreover, this expenditure is predominantly funded from public sources.

In the EU countries the share of inpatient services in total health care outlays ranges from 25% to 50% and at the same time at least 80% of the expenditure on inpatient services is covered from public funds. In Poland in 2009 the cost of inpatient health care services accounted for 47% of the total costs of health care. The costs of drug reimbursement ranked second (15%) and primary health care – third (13%) (See Table 3).

Table 3. Cost structure of health care services

Costs of health care services	2008		2009		Dynamic 5 = (3-1)/1
	in thousand PLN (1)	share % (2)	in thousand PLN (3)	share % (4)	
Primary health care	5 833 901	12%	7 385 970	13%	27%
Specialist outpatient health care	3 940 396	8%	4 218 779	8%	7%
<u>Hospital treatment</u>	23 802 149	48%	25 775 385	47%	8%
Psychiatric health care and addictions treatment	1 677 905	3%	1 926 550	4%	15%
Medical rehabilitation	1 561 335	3%	1 754 051	3%	12%
Continuing health care	911 956	2%	1 029 002	2%	13%
Dental services	1 738 770	4%	1 849 403	3%	6%
Sanatorium treatment	475 408	1%	636 473	1%	34%
Emergency treatment and ambulance transport	30 543	0,1%	34 046	0,1%	11%
Preventive health programmes	94 942	0,2%	119 165	0,2%	26%
Services contracted separately	1 156 047	2%	1 285 903	2%	11%
Orthopaedic equipment	577 033	1%	587 480	1%	2%
<u>Drug reimbursement</u>	7 367 045	15%	8 238 157	15%	12%

Source: compilation based on the Financial Statement of the National Health Fund (NFZ) for the year 2009.

The data on health care in the OECD countries presented in Table 4 reveal considerable differences as regards both the average cost of medical consultation and the average cost of hospital stay in particular countries. In Hungary the costs of medical consultation are the lowest (approximately 2 €) whereas in Denmark the said costs are the highest (90 €) – Table 4.

Table 4. The average cost of hospital stay and the average cost of doctor's consultation in the year 2002 (€)

Countries	Cost of hospital stay	Cost of medical consultation
Hungary	537	2
Poland	564	10
Czech Republic	808	9
Spain	2 825	45
Germany	3 563	38
Denmark	5 589	90

Source: A. Kozierekiewicz “Jednorodne Grupy Pacjentów. Przewodnik po systemie”, p. 19, Narodowy Fundusz Zdrowia – Centrala Publishing House, 2009.

The distribution of the average cost of hospital stay is similar to the distribution of the average cost of medical consultation and thus in Hungary just like in Poland the average cost of hospital stay amounts to approximately 550 € while in Germany the said cost is 3.5 thousand € and in Denmark – 5.5 thousand €.

Although patients use hospital services less often than outpatient medical consultations the financial burden pertaining to financing hospital treatment is much heavier.

The patients from the Czech Republic and Hungary receive medical consultations most frequently i.e. around 13 times a year on average while the Swedes use this type of services only 3 times a year.

As regards hospital stays in France 28 in 100 people used hospital services and in Portugal this proportion was 9 in 100 people (based on A. Kozierkiewicz “Jednorodne Grupy Pacjentów. Przewodnik po systemie”, p. 20, Narodowy Fundusz Zdrowia – Centrala Publishing House, 2009).

The difference with regard to the financial burden between outpatient and inpatient health care services results in inpatient services being treated in a special way.

The above analysis very clearly indicates the importance of hospital treatment ensuing from the fact that inpatient health care services generate the highest costs and at the same time they entail rapidly growing costs pertaining to the development of new technologies. For these reasons it must be recognized that the organization and the mode of financing inpatient health care services constitute one of the most significant issues in health care.

6. CHARACTERISTIC FEATURES OF DRG SYSTEMS

Most systems of inpatient health care organization in the EU were based on the case-mix systems derived from the American DRG system. The DRG system was created by Robert Fetter at Yale University. It was implemented in 1983 in the Medicare system – a quasi-public system covering the people over 65 years of age.

The DRG-based system has been in operation for 20 years in its many variations among others in the USA, France, Great Britain, Bulgaria, Greece, Romania, Hungary, the Czech Republic, Finland, Norway, Sweden, Austria, Belgium, the Netherlands and in Italy. Poland implemented the system on 1 July 2008 (Table 5).

Table 5. DRG systems evolution

1970s	Yale DRG (USA)				
1983	HCFA DRG (USA)				
1986		GHM 1 (France)			
1988				AP DRG	
1991					
1992					
1993	Hungary				
1995	<i>Italy</i>				
1996			Nord DRG		
1997		GHM 2 (France)		<i>Spain</i>	
1999		EfP (France)			AR DRG
2002			Denmark		
2003	HRG (England)				Germany
2004		PPS (France)			
2008	JGP (Poland)				

Source: own compilation based on Health Care Manage Sci (2006), p. 216.

7. BASIC PRINCIPLES OF DRG SYSTEMS

The DRG system is based on classifying patients into relevant groups which are homogeneous in terms of clinical condition and resource consumption. Patients are assigned to groups pursuant to the following factors: ICD diagnoses – proper diagnosis and comorbid conditions diagnosis, administered medical procedures, patient's age and sex.

Each group should be of clinical significance which is associated with a similar method of treatment and specific characteristics of patients related to the length of hospital stay, kinds of medical procedures administered on patients, diagnostic services or medications these patients received etc.

– particular groups should be made up of patients whose treatment is similarly cost intensive i.e. they are expected to use the same level of hospital resources

– patients are allocated to one group on the basis of generally available clinical information derived from hospital medical records pertaining to the patient's condition or treatment administered on him or her.

Table 6. Patient classification system in selected European countries

Country	Patient classification system (PCS)	Medical diagnosis codes	Medical procedure codes
Great Britain	HRG	ICD-10	OPCS-4.4
Austria	LDF	ICD-10	ACP
Belgium	APR DRG	ICD-9 CM	ICD-9 CM
Bulgaria	IR DRG	ICD-9 CM	ICD-9 CM
Czech Republic	AP DRG, IR DRG	ICD-10	ICPM
Denmark	NORD DRG, DK DRG	ICD-10	NCSP
Finland	NORD DRG	ICD-10	NCSP
France	GHM, PŕE	ICD-10	CDAM
Germany	G DRG, (AR DRG)	ICD-10-SGBV	OPS-301 v.2.0
Greece	HCFA DRG	ICD-9 CM	ICD-9 CM
Italy	HCFA DRG	ICD-9 CM	ICD-9 CM
Norway	NORD DRG	ICD-10	NCSP
Poland	JGP	ICD-10	ICD-9 CM
Portugal	HCFA DRG	ICD-9 CM	ICD-9 CM
Romania	HCFA-, AP-, IR- DRG	ICD-10	ICPM
Spain	HCFA DRG	ICD-9 CM	ICD-9 CM
Sweden	NORD DRG	ICD-10	NCSP
Switzerland	AP DRG	ICD-10	ICD-9 CM

Source: own compilation based on Health Care Manage Sci (2006) 9: p. 216.

The variables pursuant to which patients are categorized into groups in the Polish system of Homogeneous Groups of Patients (System Jednorodnych Grup Pacjentów) encompass: diagnosis, administered medical procedures, complications and comorbidities, patient's age and the length of hospital stay.

Currently there are around 500 Homogeneous Groups of Patients (JGPs). The JGP model was based on the British HRG model but it was modified and adjusted to Polish conditions. The JGP model has been in operation in Poland for one year and it is hard to carry out a detailed analysis.

Nevertheless, it can be stated with a high degree of certainty that due to the fact that the JGP model is not related to the actual costs of health care services some health care services are underestimated and some are overestimated. The costs of medical services in Poland are still determined only by approximate values although the health insurance scheme was put into operation 10 years ago.

Table 7 shows how other countries have tackled this issue. In Great Britain cost accounting is carried out on the whole population of 300 hospitals. In Germany there exists an autonomous institution InEK which calculates costs on a completely independent basis on a sample of 214 hospitals (which accounts for 12% of the total number of hospitals). In Hungary the data sample encompasses 30 hospitals and in France – 52 hospitals (which accounts for 3% of the total number of hospitals).

Table 7. Size of the data sample compared to the number of hospitals being reimbursed in DRGs

Country	Number of hospitals included in Data Sample	Number of hospitals using DRGs	Hospitals in data sample as percentage of all hospitals using DRGs
England, Britain	300	300	100%
France	52	1 564	3.3%
Germany	214	1779	12%
Hungary	30	160	18.8%
Italy	8	761	1.1%
Netherlands	23	104	22.1%
Poland	–	–	–
Spain	18	–	–

Source: own compilation based on Health Care Manage Sci (2006) 9: p. 217.

Although the Regulation of the Minister of Health and Social Welfare of 1998 *on detailed principles of cost accounting in public health care facilities* is effective in Poland the payer is not familiar with the costs of health care and there are no statutes which would impose an obligation of reporting such costs to the National Health Fund (NFZ).

There are still situations when the valuation of a given group results from negotiation and pressure on the part of medical circles with vested interest.

8. CONCLUSIONS AND RECOMENDATIONS

The implementation of the JGP system in inpatient health services accounting imposed some order and improved the quality of medical reporting in hospitals. Medical procedure classification (ICD-9), although still imperfect, made it possible to carry out a reliable and detailed analysis of the epidemiological data of the society.

The next stage which should take place in the change management system consists in relating the point valuation of a given homogeneous group of patients (JGP) to actual costs. Such action will enable hospitals to effectively use public funds derived from the health insurance contribution.

One of the major problems the health care services reporting system is faced with is the so called creative reporting of the health care services providers which does not correspond to the actual medical procedures. Creative reporting is an attempt at obtaining additional financial resources from the payer in the situation when a proportion of medical procedures is underestimated.

This problem can be solved by adequate estimation of lump-sum costs of medical services and by intensifying service providers supervision.

Finally, it is necessary to indicate the direction in which all the DRG accounting systems are evolving which consists in a holistic attitude towards the patient. Current DRG systems are more profitable for multiple hospitalizations of the patient than administering complete treatment during one hospital stay. Such practices are acceptable although they contradict the philosophy behind DRG systems.

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ORGANIZACJA I FINANSOWANIE SZPITALNYCH ŚWIADCZEŃ ZDROWOTNYCH. ANALIZA PORÓWNAWCZA SYSTEMÓW DRG

W Polsce system Jednorodnych Grup Pacjentów (JGP) został wprowadzony 1 lipca 2008 roku. Nowym sposobem rozliczeń został objęty pobyt pacjenta w szpitalu. System JGP w Polsce został w swojej pierwotnej postaci przejęty z modelu brytyjskiego, chociaż w ciągu niecałego roku funkcjonowania znacznie ewoluował i można uznać, że polska wersja HRG jest odrębnym modelem w ramach systemów DRG. Po raz pierwszy system DRG został wprowadzony w Stanach Zjednoczonych w roku 1983 (Uniwersytet w Yale) w publicznym systemie Medicare. Obecnie DRG obowiązuje w większości krajów Unii Europejskiej. Głównym celem artykułu jest analiza wpływu nowego systemu rozliczania kosztów pacjenta na poziom finansowania świadczeń opieki zdrowotnej oraz na poprawę wskaźników dotyczących efektywności zarządzania w ochronie zdrowia społeczeństwa. Artykuł wskazuje również na problemy wynikające z wprowadzenia nowego systemu opartego na budowie homogenicznych grup pacjentów. Grupy te są wyodrębnione pod względem diagnozy głównej, diagnozy współistniejącej, płci i wieku.

Mimo, że jest to jeden z najnowocześniejszych systemów rozliczeniowych w zakresie ochrony zdrowia to niestety posiada również wady. Jednym z najistotniejszych problemów, który jest bezpośrednim skutkiem wprowadzenia DRG jest odejście od leczenia kompleksowego pacjenta na rzecz wybranej (najdroższej) procedury medycznej.

Słowa kluczowe: finansowanie świadczeń opieki zdrowotnej, Jednorodne Grupy Pacjentów, efektywne zarządzanie systemem ochrony zdrowia.