PRACA ORYGINALNA

Estimating costs incurred by a public payer in Poland for selected morbid entities

Szacowanie kosztów wyselekcjonowanych jednostek chorobowych ponoszonych przez publicznego płatnika w Polsce

Tomasz Holecki, Magdalena Syrkiewicz-Świtała, Karolina Szymaniec

Zakład Ekonomiki i Zarządzania
w Ochronie Zdrowia
Wydziału Zdrowia Publicznego
Śląskiego Uniwersytetu Medycznego
w Katowicach

ABSTRACT

Estimating costs incurred by a public payer in Poland for selected morbid entities consists of an attempt to diagnose the expenses incurred in connection with a medical event. Among the many measures of the health status of the population, its material welfare and the amount of medical costs, the level of expenditures incurred by the institutional payer is a measure of state intervention in the market of medical services. Particular correlations were performed on the basis of fundamental determinants such as sex and the type of diagnosed morbid entity in a particular period in relation to the 10th Revision of Diseases and Deaths ICD: I00-I99, J40-J47, M00-M99, D50-D59, N00-N23. The research area included the Silesian voivodship (Poland) where the number of potential patients under financial care of this branch of the National Health Fund is approximately 4.8 million persons.

KEY WORDS
National Health Fund, cost of disease, health care market, public finance

ADRES DO KORESPONDENCJI:
Dr n. hum. Tomasz Holecki
Zakład Ekonomiki i Zarządzania
w Ochronie Zdrowia
Wydziału Zdrowia Publicznego
Śląskiego Uniwersytetu Medycznego
w Katowicach
ul. Piekarska 18
41-902 Bytom
tel. +48 32 397 65 37
e-mail: tholecki@sum.edu.pl

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STRESZCZENIE

Szacowanie kosztów wyselekcjonowanych jednostek chorobowych ponoszonych przez publicznego płatnika w Polsce jest próbą diagnozy części wydatków ponoszonych w związku z konkretnym zdarzeniem medycznym. Wśród wielu mierników stanu zdrowia populacji, jej zasobności materialnej czy poziomu obciążenia kosztami, właśnie poziom wydatków ponoszonych przez płatnika instytucjonalnego jest miernikiem ingerencji państwa w rynek usług medycznych. Poszczególnych korelacji dokonano opierając się na podstawowych czynnikach determinujących, jakimi są płeć oraz rodzaj zdiagnozowanej jednostki chorobowej, w od-

niesieniu do 10 Rewizji Chorób i Zgonów ICD: I00-I99, J40-J47, M00-M99, D50-D59, N00-N23. Obszar badawczy stanowiło województwo śląskie, gdzie liczba potencjalnych pacjentów znajdujących się pod finansową kuratelą oddziału Narodowego Funduszu Zdrowia wynosi ok. 4,8 mln osób.

SŁOWA KLUCZOWE
Narodowy Fundusz Zdrowia, koszt choroby, rynek ochrony zdrowia, finanse publiczne

INTRODUCTION

The socio-economic approach to the problem of financing medical services allows one to select a measurable part, including a non-measurable part, subjective and frequently expensive and less easy to define naturally.
A certain level of patient satisfaction is perceived as standard in a consumer society, and a lack of satisfaction is seen as a lack of comfort or injustice. Among the many measures, the simplest is the coefficient of a society's affluence – **(I) the Gross National Product (GNP)**, *de facto* a measure of productiveness, and its various types. If both the quantity and the quality of the given services is determined by the national potential, then the size of this aggregate and its part intended for health care influences the quality of patients' lives and it influences potential patients, who being conscious of the level of medical care and its accessibility, experience calmness or anxiety about it.
Entering the area of a normative economy of prosperity and a dispute about the fair division of goods, it is known that it is not possible to introduce a homogeneous coefficient, but one can try to perform it in an estimative and subjective manner. A solution can be for example, **(II) the Index of Sustainable Economic Welfare,** which by gathering information about the consumption of goods, tries to formulate conclusions about the welfare of the studied social group by measuring: the level and proportions of expenses on consumptive and investment aims, the amount of free time, the amount of work in the household, expenditures on health services (in various periods), educational expenses, etc. [1].
It is also possible to use the coefficients used by, for example, the United Nations **(III) HDI (Human Development Index) and (IV) HPI (Human Poverty Index)** concluding the situation of people on the basis of GNP *per capita*, estimating the length of life at birthday or by analyzing the level of education.
Additional information which seems to be essential from the point of view of estimating the costs of morbid entities is, among others, income or other financial services, state financial transfers, non-public transfers, informal payments in health care, so-called "*proofs of gratitude*", the degree of resignation from treatment processes for financial reasons, resignation from the purchase of prescribed medicines, the degree of using non-public health services, refusal to perform a service (limits, queues, etc.), individual refinancing of a hospital stay (additional tests, medicines, meals, etc.).
Since the degree of population wealth directly influences the ability to absorb medical services and the quality of life of the diagnosed population, analysis can also be based upon information about household incomes and other types of data.
However, it must be unambiguously confirmed that the undertaken analytical actions used to estimate the full costs of a disease are imperfect by definition. Particular categories defined as measurable, are often diffused, methodologically, territorially, or chronologically incompatible [3]. Meanwhile, non-measurable categories are clearly speculative, since it is difficult to define the cost of suffering, elongated life with a disability or a disease, and to define the cost of a human life. However, this should not discredit any actions undertaken in order to estimate particular morbid entities, the costs of which are paid by a patient, his family or the society as a whole.

MATERIAL AND METHODS

This study uses the public payer perspective of financial analysis, mainly because of the predominant role of the National Health Fund

– the ultimate insurance fund, in the structure of public expenses on health care in Poland. It takes into account exclusively the costs which are essential for the NHF and that were accumulated by this institution. It relates to the declared costs and the input in the valid legal system [2, 3].

The aim of this study is to estimate the financial costs paid by the public payer in relation to selected morbid entities according to ICD-10 classification, in the selected period of three years (2004, 2005, 2006), both in the case of inpatient care and ambulatory special care in the area of the Silesian department of the National Health Fund. The elaboration presents part of a systematically realized cycle of analysis. The investigative periods concern the years 2008, 2009 and 2010. The article shows the socioeconomic trend, change, direction and power of interaction [5, 6].

The analysed population is 4.8 million citizens, both men and women, inhabiting the area of 12 thousand km^2 of the Silesian voivodeship, consisting of 12,5% of Poland's area. Particular correlations were performed on the basis of factors such as sex and the type of diagnosed morbid entity in a particular time. The study included dysfunctions related to the following morbid entities: circulation system (I00-I99), respiratory system (J40-J47), combined bone-muscular system and connective tissue (M00-M99), blood and hematogenous organs and diseases involving autoimmunological mechanisms (D50-D59), as well as genital-urinary system (N00-N23) diseases.

The total cost of services for the selected morbid entities (J40-J47 + I00-I99 + N00-N23 + D50-D59 + M00-M99) is accumulated in the procedures of inpatient care (approx. 97%). Basic health care takes approx. 2.42% of the whole budget, while ambulatory care only 0.57%. Differentiation due to the sex and related costs is actually not present. Slightly higher coefficients for women are practically not present. Possible savings can be therefore found in inpatient care or naturally by improving the health of the population [4].

The three graphs below show the statistical distribution of patient numbers according to the selected morbid entities and the change in the number of services in particular years (2004, 2005, 2006). Undoubtedly, the highest number of events is caused by diseases of the respiratory tract, circulation system, urogenital system and diseases of bone-muscles and connective tissue. The smallest number of events is related to diseases of the digestive tract, skin and subcutaneous tissue, blood and hematogenous organs and certain diseases in autoimmunological mechanisms.

Because a considerable part of the analysed morbid entities possesses environmental con-

Table I. Total cost of services for selected morbid entities (J40-J47 + I00-I99 + N00-N23 + D50-D59 + M00-M99) in zlo tys (1 $ = 2,9 PLN; 1 € = 4,1 PLN – exchange rate on 22.12.2008)

Tabela I. Łączny koszt świadczeń wybranych jednostek chorobowych (J40-J47 + I00-I99 + N00-N23 + D50-D59 + M00-M99) w złotówkach (1 $ = 2,9 zł; 1 € = 4,1 zł – kurs z dnia 22.12.2008 r.)

	Service costs			
	BHC	**AMBU**	**CC**	**Total**
2004				
Women	9 822 815	444 802	328 658 344	338 925 961
Men	6 160 978	368 174	313 799 420	320 328 572
Total	15 983 793	812 976	642 457 764	659 254 533
2005				
Women	9 932 653	560 384	343 620 240	354 113 277
Men	6 039 430	451 433	319 950 258	326 441 121
Total	15 972 083	1 011 817	663 570 498	680 554 398

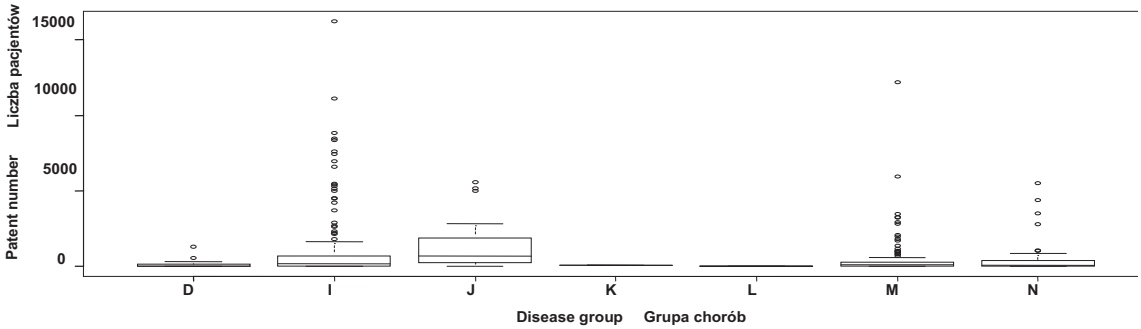

Fig. 1. Number of patients in 2004.
Ryc. 1. Liczba pacjentów w 2004 r.

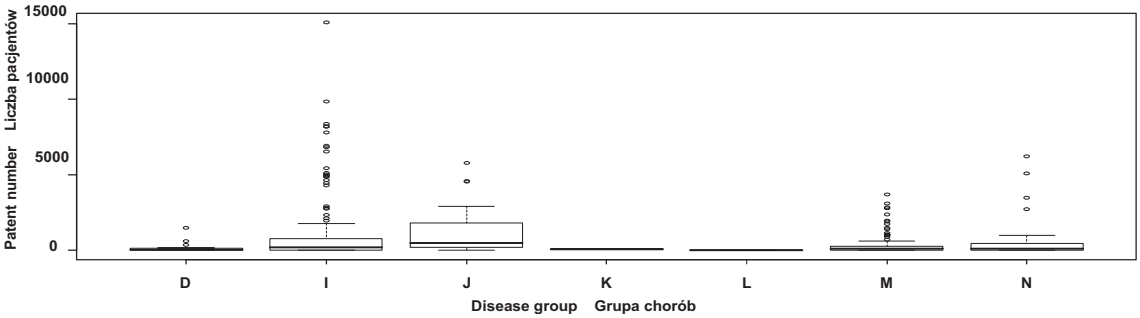

Fig. 2. Number of patients in 2005.
Ryc. 2. Liczba pacjentów w 2005 r.

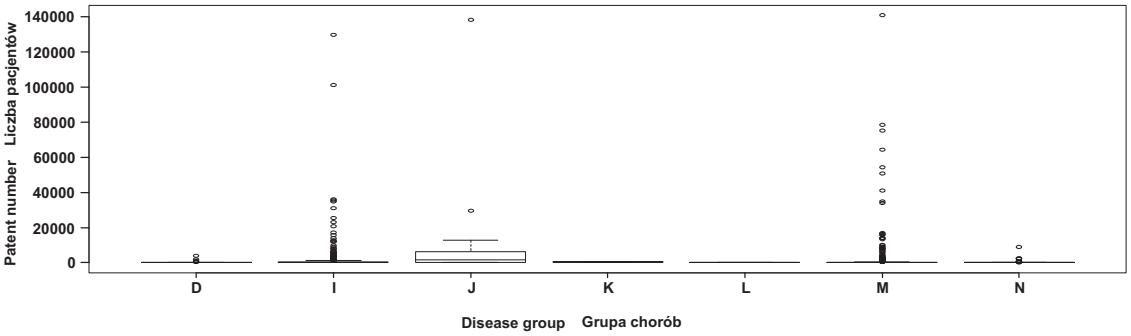

Fig. 3. Number of patients in 2006.
Ryc. 3. Liczba pacjentów w 2006 r.

ditioning „one can therefore try to answer the questions: "Is it possible to lower treatment costs through intervention in the life of patients and potential patients" and "Are these types of actions profitable regionally or on the national level in the financial meaning"? In the case of basic health care, it is profitable to decrease costs related to morbid entities J40-J47, I00-I99 and M00-M99. Any actions regarding entities N00-N23 and D50-D59 are unprofitable. In ambulatory treatment, it is moderately profitable to take action in entities I00-I99 and M00-M99. It is unprofitable to undertake any actions in entities N00-N23, D50-D59 and J40-J47. In inpatient care it is worth concentrating upon the ailments of M00-M99, I00-I99, N00-N23. It is financially unjustifiable is to influence entities: J40-J47 and D50-D59. Generally, it would be the most profitable to undertake actions aimed at limiting medical interventions related to the diseases of the circulatory system (I00-I99). The least financially profitable is to undertake actions for the diseases of blood and hematogenous organs (D50-D59). Particular costs are shown graphically in graphs 4, 5 and 6.

From the point of view of profitability, the most expensive procedures in the analysed catalogue

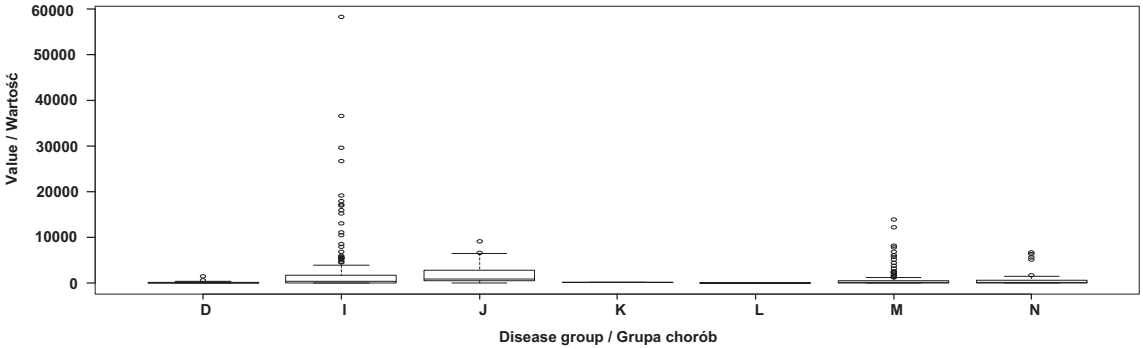

Fig. 4. Costs incurred by public payer in 2004.
Ryc. 4. Koszty poniesione przez publicznego płatnika w roku 2004.

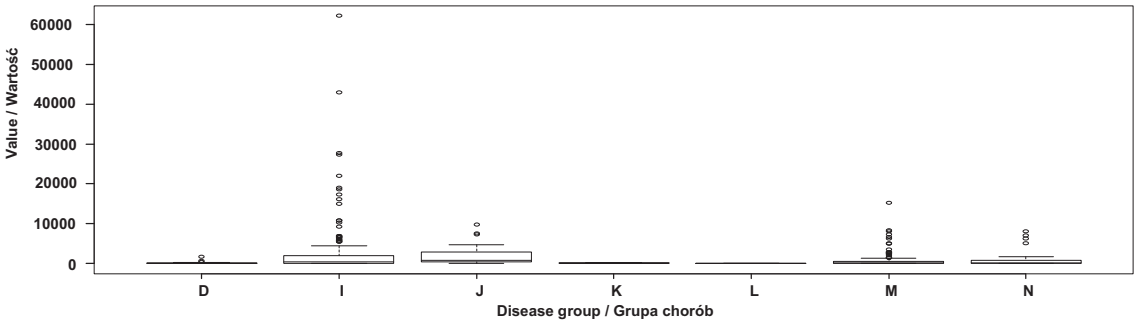

Fig. 5. Costs incurred by public payer in 2005.
Ryc. 5. Koszty poniesione przez publicznego płatnika w 2005 r.

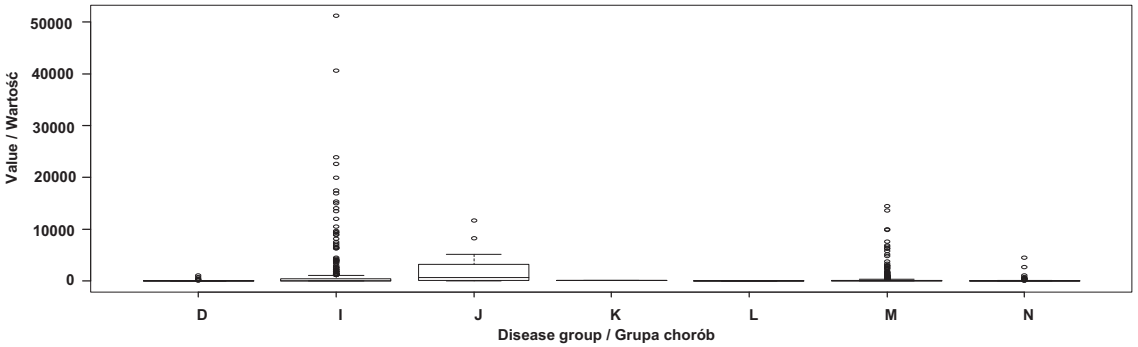

Fig. 6. Costs incurred by public payer in 2006.
Ryc. 6. Koszty poniesione przez publicznego płatnika w 2006 r.

are those related to the respiratory and circulatory system. The others demand much smaller expenditures, which is also related to the number of events. As for the sex factor, women and men accumulate a similar number of events, while in the cost category, men require more expensive procedures. The data included in graph 7 and 8 show the distribution of the number of events and costs within the scope of the analysed ailments divided into sex.

The knowledge about treatment costs creates a rational basis for public funds management, as well as a structured and perspective health policy [7]. Due to the use of modern monitoring tools of services by using a computerized database and chip card as an insurance document in relation to the electronic register of medical services, it is possible to trace public funds in the health care system. Such a type of electronic insurance document is not used on

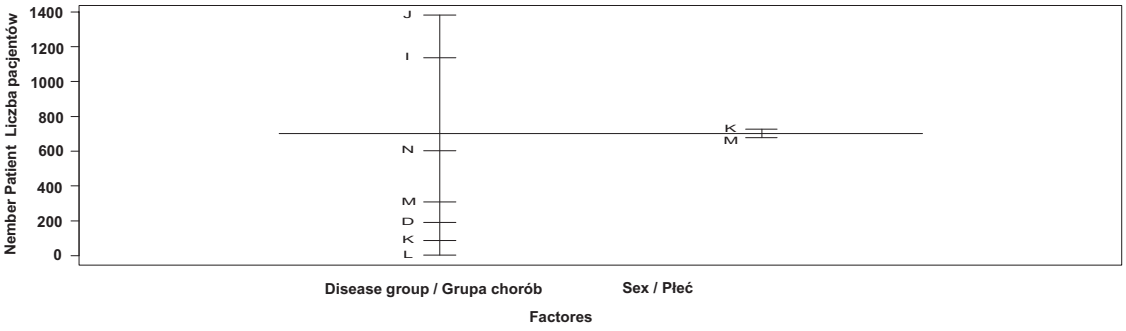

Fig. 7. Mean number of medical events registered by public payer in 2004–2006.
Ryc. 7. Uśredniona liczba zdarzeń medycznych zarejestrowanych przez publicznego płatnika w latach 2004–2006.

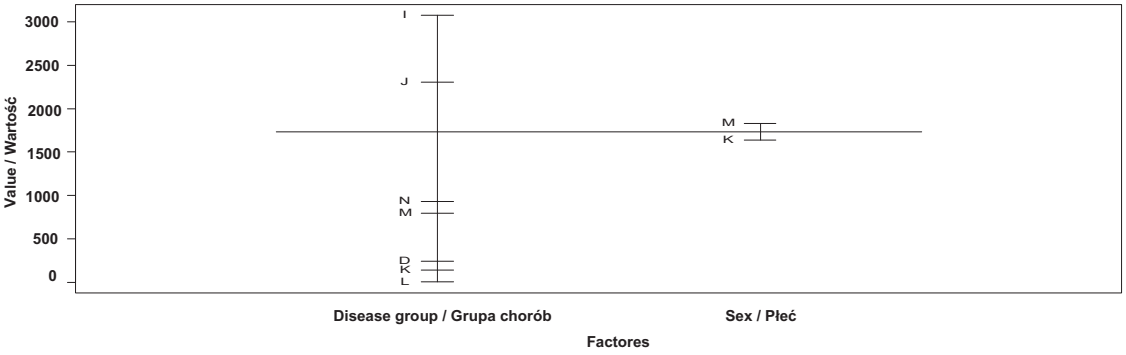

Fig. 8. Mean costs incurred by public payer in 2004–2006.
Ryc. 8. Uśrednione koszty poniesione przez publicznego płatnika w latach 2004–2006.

the whole territory of Poland, but only in the studied area of the Silesian voivodeship, as one of the largest areas of the country in respect to population and territory.

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