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Access to medical services and the wealth of Polish citizens

Abstract

The article attempts to verify the inverse care law (Hart's law) in Poland on the example of the geographic accessibility of medical human resources by citizens. The aim of the article is to analyze selected economic indicators in relation to the ratio of the number of doctors per 10,000 citizens in individual provinces in Poland. The analysis is to verify whether medical practitioners in Poland are guided by the wealth of the citizens of a given region when choosing the place of providing medical services. A research hypothesis was tested, according to which economic indicators - i.e. gross income per capita, gross domestic product, unemployment rate, local public spending on health care, and private household health expenditure – are correlated with density of physicians, i.e. the number doctors for 10,000 residents in a given province in Poland. The correlation was examined using Spearman's correlation coefficient, and the results obtained showed that there is a geographical variation in access to doctors in Poland and that Hart's law was partially confirmed. Based on the conclusions, a statement can be put forward that, although access to medical services is universal and provided by the state, it varies and is not equal for all citizens.

Key words: health economics, health policy, medical services, medical care, health, Hart's law.

Introduction

Health is a form of capital, as the inconvenience caused by a disease entity burdens not only by the sick person themselves, but also their family, employer, business partners, and the whole environment in which they function and the people they interact with (Laskowaka 2000, p. 15). Nowadays, in economic analyses, much attention is paid to the valuation of health and the shaping of the law of supply and demand for medical services. The assessment also concerns the impact of political decisions on health policy, and on satisfying health needs and shaping forms of medical care (Suchecka 2016, p. 7). On the other hand, health care is considered to be one of the determinants of health, as it is also correlated with genetic predispositions, the social environment and the natural environment perceived by the consumer/patient individually (Grossman 2000, pp. 234-352).

One of the most important elements of health care is the issue of human resources, which significantly influences the effective functioning of healthcare system as a whole. Doctors, together with other medical professionals, play a particular role in society since they are entrusted with health, which is one of the most important human assets. Provision of properly distributed and educated medical staff is one of the challenges in the current health system (Polish Central Statistical Office, *Zdrowie i Ochrona Zdrowia* 2016, p. 70).

Looking at the premature mortality rates of people of working age, and the number of years in disability due to chronic diseases, it should be noted that Poland, in this sense, closer leans more towards the standards of Central and Eastern Europe, rather than the European Union (Jakubowska 2016, p. 51). As a result, it is reasonable to provide citizens with significantly better access to medical personnel.

This article was inspired by the issues of geographic distribution of medical staff resources, derived from Julian Hart's findings. The aim of the article is to analyze selected economic indicators in relation to the ratio of the number of doctors per 10,000 citizens in individual Polish provinces. The analysis is to verify whether Polish doctors are guided by the wealth of the citizens of a given region when choosing the place of providing medical services. A research hypothesis was tested, according to which economic indicators - i.e. the average income per resident, gross domestic product (GDP) in a given province, the unemployment rate, local public spending on health care, and private household health expenditure – are correlated with the number doctors for 10,000 residents in a given province in Poland. The correlation was examined using Spearman's correlation coefficient, and data collected from the Polish Central Statistical Office (GUS) and the Polish Chamber of

Physicians and Dentists (NIL) was analyzed. In the article, Polish and English literature items from the fields of health economics and health policy were used, and the databases BazEkon, ProQuest and PubMed were accessed.

In the first section, the article describes the elements of the medical market that differentiate it from other markets. Next, the theoretical basis of the paper was presented, i.e. Hart's law and other studies of the inverse care law. The third section discusses the results of the analysis of economic indicators with the number of available doctors in Poland in individual provinces. Due to the pilot nature of the analysis, a number of recommendations for further research were included at the end of the paper.

Characteristic features of the medical market

The first characteristic feature of the medical market is the existence of a third party that deals with the purchase-sale of a medical service, namely a payer, which may be a state or an insurance institution (Morris, Devlin 2012 p. 110).

The diversity of medical care is also determined by external effects related to increased access of the public to medical services by increasing public subsidies (Suchecka 2016 p. 64). Another distinguishing feature may be the fact that enterprises on the supply side are not always driven purely by profit. They operate as public entities, and so, they are funded by the state while their activity is dictated by the necessity to satisfy the need to improve the health of citizens (Morris, Devlin 2012 p. 158). What further distinguishes the medical market from other markets is the limited application of conventional market mechanisms resulting from the existence of public health protection (Henderson 2002 pp. 10-12).

The medical market is also marked the asymmetry of information between the doctor, acting as a medical service provider, and the patient, acting a consumer. When ill, patients go see the doctor to obtain information about their health, a possible diagnosis and treatment methods, while the doctor has the relevant medical knowledge and decides on the treatment method. The existing asymmetry of information offers a significant advantage to service providers, which is why market mechanisms cannot fully apply to health care. This asymmetry also prompts the creation of demand through supply, which means that healthcare providers have a significant impact on the consumption of services by patients (Suchecka 2016, p. 66). Consumers also experience the lack of ideal information in other service markets, but the risk of making a mistake while consuming the service is incomparably high in health care, as it may decide about human life (Getzen 2000 p. 148).

Last but not least, the heath care market stands apart because of the price of its services, which is often unknown to the consumer, and which can be balanced out by waiting time for advice, distance and time needed to reach the doctor, and the quality of services (Suchecka 2016, p. 118). Medical care is also distinguished by the uncertainty of the demand for its services and the effectiveness of treatment, prompting the emergence of a separate risk-taking market (Suchecka 2016, p. 67). Consumption of medical services is unpleasant, as it takes place during the state of illness and overall indisposition, and may be either preventive (vaccines) or follow-up after the dysfunction. This consumption is usually associated with pain and physical or mental discomfort on the part of the consumer. In Poland, all citizens use medical services throughout their life, which does not occur in any other market except for the food market.

Hart's law

The specificity of the medical market means that the location of service providers representing the supply side of a transaction does not necessarily need to correspond to the local demand. The choice of a place of work by a doctor is convergent with the place of providing a medical service, and then, with the possibility of using this service by patients. Each physician is bound by the medical oath (Polish: *przyrzeczenie lekarskie*)[1], from which it follows that providing help and treatment of patients should be performed regardless of the place of residence or the financial status of the patient. In addition, every Polish citizen is guaranteed access to medical care in the same scope under Art. 68 of the Constitution of the Republic of Poland (Journal of Laws 1997, 78.483).

What inspired the deliberations undertaken in this paper was Hart's deduction according to which "the accessibility of quality medical services in a region is inversely proportional to the size of the needs of the population living there", also known as Hart's law or the inverse care law (Włodarczyk 2010 p. 175). In his theory, Hart pointed out that the

[1] The content of the oath (free translation): "I hereby receive, with respect and gratitude to my Masters, the title of a doctor, and I am fully aware of the duties associated with it; I promise to perform these duties conscientiously; serve life and human health according to my best knowledge, counteract suffering and prevent disease, and help the sick regardless of their differences, such as: race, religion, nationality, political views, wealth and other conditions, acting in their good interest only and showing them due respect; I will not abuse their trust and keep a medical secret even after the patient's death; I will guard the dignity of the medical profession and will not dishonor it, referring to fellow doctors with due kindness, not questioning trust in them, but acting impartially and with regard to the good of the sick; I will constantly expand my medical knowledge and bring to the medical world all that I can invent and improve." *Kodeks Etyki*, Source: https://www.nil.org.pl/__data/assets/pdf_file/0003/4764/Kodeks-Etyki-Lekarskiej.pdf (retrieved: 10.08.2018).

inverse care law works better where medical care is most exposed to market forces, and less so when the impact of market mechanisms is limited" and that inequalities are driven by a desire for profit (Hart 2000 pp. 15-19). Hart took into account the cultural patterns of beneficiaries' behavior and the financial incentives that service providers are guided by (Włodarczyk 2010 p. 175). According to Hart, medical graduates who could choose a place of work, more willingly chose middle-class areas where patient lists were shorter, and the neonatal mortality and incidence rates - lower. Meanwhile, industrial areas characterized by less attractive health indicators and economic results were to be left for physicians who were assigned to a medical facility arbitrarily (Hart 1971). Hart argues that a population living in wealthier regions is also viewed more attractive as consumers of medical services, and for doctors planning a professional career, the prospect of working for prosperity is an important argument for settling in a given area and providing services there (Włodarczyk 2010, p. 175).

Results of research conducted in the United Kingdom justify the legitimacy of the inverse care law by means of an analysis of waiting time for an appointment, duration of consultations, and diagnosis of disease among patients from different social classes. However, the waiting time for an appointment and the duration of a visit are closely related to density of physicians in a given region.

In one study of the average waiting time for surgery, it was found that wealthier citizens (Class 1) waited less for surgery and their cases took less to be qualified for urgent procedures, compared to citizens Class 6 and 7. This resulted in a longer waiting time for poorer residents, and thus, even further deteriorated their health (Pell, Pell, Norrie, Ford, Cobbe 2000).

In a study regarding depression, meanwhile, it was observed that it is considered a disease that can be cured in affluent areas, while being treated as a problem of interaction in poorer areas. It was also found that the duration of an appointment was related to the patient's wealth, and an increase in the length of consultations by 50% led to a 32% increase in the recognition of depression as a disease entity (Chew-Graham, Mullin, May, Hedley, Cole 2002).

Mercer and Watt conducted a survey in Scotland, which involved more than 3,000 patients and 26 general practitioners (family doctors): 16 from the poorest regions and 10 from more affluent areas. The study showed that lower-class patients had to wait longer for an appointment and were less satisfied with the consultation, plus the time they spent at the doctor’s was shorter, they experienced more stress, and the involvement and inclusion of the

patient in the treatment process was more limited than in the case of affluent citizens (Mercer, Watt 2007).

Based on several studies, Seddon argues that it has been repeatedly demonstrated that lower-paid citizens are much less privileged in accessing and using medical care. Seddon emphasizes the importance of the relationship between socio-economic deprivation and longer waiting times, referring to one study in which 21% of patients with lung cancer were ineligible for treatment due to the excessive waiting time for radiotherapy (Seddon 2007). Most sociological studies on Hart's law confirm the existence of this regularity and indicate that the source of the problem is the socio-economic status of patients and interpersonal relations between the doctor and the patient.

In the analytical part of the article, an analysis was carried out to test the relationship between the number of doctors and the number of citizens, adopting as measures various economic indicators of the wealth of local population (in this case, a province in Poland). The factors are: gross income per capita, gross domestic product, unemployment rate, local public spending on health care, and private household health expenditure. In this article, access to medical services is understood as the physical possibility of seeing the doctor, regardless of their specialty or medical degree. The number of doctors was determined using the NIL database, taking into account doctors and dual-practice physicians. The following research hypothesis is verified in the article: economic indicators, i.e. gross income per capita, gross domestic product, unemployment rate, local public spending on health care, and private household health expenditure, are correlated with density of physicians, i.e. the number of doctors per 10,000 residents in a given province in Poland. The analysis was to verify whether medical practitioners in Poland are guided by the wealth of the citizens of a given region when choosing the place of providing medical services.

Analysis of economic indicators and accessibility of doctors

To assess the relationship between the factors, Spearman's correlation coefficient was used[2]. The analysis does not account for all factors of affluence and should be viewed as a pilot study.

[2] The number of observations (n = 16) justifies the choice of the calculation method (Pułaska-Turyna B, 2011, p. 322).

Table 1. Number of doctors per 10,00 residents and percentage share by province in 2017

Province	Number of doctors per 10,000 residents	Share (%) in total number of doctors
Dolnośląskie	30	8,1
Kujawsko-pomorskie	30	4,7
Lubelskie	**38**	6,0
Lubuskie	**24**	**1,8**
Łódzkie	**43**	8,0
Małopolskie	37	9,3
Mazowieckie	**43**	**17,2**
Opolskie	**24**	**1,8**
Podkarpackie	27	4,2
Podlaskie	**43**	3,7
Pomorskie	34	5,8
Śląskie	36	**12,2**
Świętokrzyskie	31	**2,9**
Warmińsko-mazurskie	**25**	**2,6**
Wielkopolskie	30	7,6
Zachodniopomorskie	33	4,1

Note: *extreme values in bold

Source: own study based on GUS and NIL data; http://stat.gov.pl/obszary-tematyczne/ludnosc/ludnosc/powierzchnia-i-ludnosc-w-przekroju-terytorialnym-w-2018-roku,7,15.html; https://www.nil.org.pl/rejestry/centralny-rejestr-lekarzy/informacje-statystyczne (retrieved 10.08.2018).

Tab. 1 shows that the highest percentage share of all doctors in Poland is available to patients in the provinces of Mazowieckie (17%) and Śląskie (12%), while the smallest in Świętokrzyskie and Warmińsko-Mazurskie (3%), as well as Lubuskie and Opolskie (2%). As far as the number of doctors per 10,000 residents is concerned, the highest value was recorded for Mazowieckie, Łódzkie and Podlaskie (43), followed by Lubelskie (38), while the lowest – in Warmińsko-Mazurskie (25), and Opolskie and Lubuskie (24). On average, there are 33 doctors per 10,000 residents in Poland. residents. It can therefore be said that, in Poland, in geographical terms (with reference to Polish provinces), there is a quantitative disparity of physicians and therefore of access to medical services.

Table 2. Results of the correlation analysis between the number of doctors per 10,000 residents and economic indicators in 2017

Item		Number of doctors per 10,000 residents	Gross income per capita	Unemployment rate	GDP per capita	Local public spending on health care
Gross income per capita	Correlation coefficient	**0,557**	x	x	x	x
	Significance	0,025	x	x	x	x
Unepmployment rate	Correlation coefficient	0,071	-0,458	x	x	x
	Significance	0,793	0,075	x	x	x
GDP per	Correlation	0,319	0,847	-0,586	x	x

capita	coefficient					
	Significance	0,228	0,000	0,017	x	x
Local public spending on health care	Correlation coefficient	0,176	-0,229	0,059	-0,203	x
	Significance	0,515	0,393	0,828	0,451	x
Private household health expenditure	Correlation coefficient	**0,449**	**0,647**	-0,368	0,494	-0,135
	Significance	0,081	0,007	0,161	0,052	0,617

Note:*analysis of Spearman's rank correlation coefficients was used, n = 16, α = 0.05. Values for which a positive correlation was recorded are in bold.
Source: SPSS-based calculations based on GUS and NIL data; *Aktywność ekonomiczna ludności Polski 2017*, http://stat.gov.pl/podstawowe-dane/, http://stat.gov.pl/obszary-tematyczne/zdrowie/ https://www.nil.org.pl/rejestry/centralny-rejestr-lekarzy/informacje-statystyczne (retrieved 10.08.2018).

Analyzing the relationship between the number of doctors per 10,000 residents and individual economic indicators (Table 2), it can be noted that, at a likeliness level of 0.05, there is a strong positive correlation between gross income per capita and the number of doctors in a given province. Based on this, a conclusion can be drawn that the income of the population, and thus potential patients, is a strong determinant of the choice of the place where the services are provided by doctors. However, assuming α = 0.1, there is also a correlation between private household health expenditure and the number of medical practitioners in a region. This may mean that medical graduates are more likely to choose the location of their practice in areas where the patient is ready to pay for a medical service from private funds.

The second of the identified correlations can be linked to the significant correlation between gross income per capita and private household health expenditure. This means that the higher the gross income per capita, the higher the willingness of patients to incur private expenses for health care.

As concerns the other analyzed indicators of affluence, no correlation with the number of doctors in a given province was recorded. No correlation between the number of doctors and local public spending on health care may also indicate that physicians are less interested in working in the public sector, i.e. under contracts provided by the Polish National Health Fund (NFZ). A doctor's salary is significantly higher for private consultations than a refund from a primary care visit offered by NFZ (Regulation No. 22/2018/DSOZ).

In summary, the obtained results make it possible to conclude that there is a geographic distribution of medical human resources in Poland and it is correlated with some economic

indicators. Thus, the occurrence in Poland of Hart's inverse care law was partially confirmed. At the same time, the hypothesis was partly confirmed that medical practitioners are guided by the wealth of the consumers of their services when choosing the place of work.

Conclusions

In order to use health care as a means to improve health, it is necessary to consume a medical service, for which physical access to a doctor is necessary (Suchecka 2016 p. 64). As indicated by the results of the conducted analysis, in the case of Poland, this consumption is regionally dependent on economic conditions, i.e. gross income per capita and household health expenditure. On the basis of the analysis of secondary data from GUS and NIL for 2017, a significant geographic disparity of doctors' availability in the cross-section of provinces was identified, with the situation being the most favorable in Łódzkie, Mazowieckie and Podlaskie provinces (as many as 43 doctors per 10,000 residents) and the most unfavorable in Lubuskie, Opolskie and Warmińsko-Mazurskie (no more than 25 doctors per 10,000 residents).

Among the economic indicators that were taken into account in the analysis, average gross income per capita and household health expenditure are statistically positively correlated with the number of doctors per 10,000 residents. A positive correlation was also observed between gross income per capita and private health expenditure, while GDP, unemployment rate and local public spending health did not show any correlation. The hypothesis put forward in the article (derived from Hart's law) according to which the number of doctors is to some extent related to the wealth of patients was partly confirmed by the data analysis of provinces in Poland.

The results obtained should serve as an encouragement for conducting more in-depth analyses. The study did not take into account the specialty or medical degree of doctors, which may also affect their accessibility to the patient. In future analyses, territorial units such as *poviats* (districts) could be considered, as such data can better demonstrate wealth, spending and income differences between groups of residents. Due to the demand and supply adaptation processes, it would be worth undertaking a more long-term research in this area. In addition, quantitative research does not allow to properly identify the real motivations of doctors, hence it would be reasonable to supplement these findings with qualitative research

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