NEROVNOSTI V ZDRAVOTNÍCTVE V EURÓPSKYCH OECD KRAJINÁCH

HEALTHCARE INEQUALITIES IN EUROPEAN-OECD-COUNTRIES

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Abstrakt (SJ)

Autori v tomto článku budú analyzovať a porovnávať nerovnosti zdravotníckych systémov postkomunistických a západných krajín Európy. Nerovnosť sa skúma na dvoch úrovniach: medzinárodnej, ako rozdiely medzi zdrojmi systémov zdravotníctva a zdravotným stavom obyvateľstva, ako na vnútroštátnej úrovni ako miera nerovnosti rozdelenia finančného príspevku na zdravotný systém a účinky na zdravie obyvateľstva. Je dokázané, že bývalé komunistické krajiny stále charakterizuje iná štruktúra systému zdravotníctva v porovnaní so západnými susedmi. Postkomunistické krajiny míňajú menej peňazí na zdravie, zdravotný stav ich obyvateľstva je nižší a nerovnomerne rozdelený.

Abstract (AJ)

Authors in this article analyse the inequality in health systems in post-communist and Western Europe countries. Inequality is researched at two levels: international as differences between health system resources, population health status and intranational as unevenly distribution of financial contribution to health system and health effects in population. It is proven that former communist countries still characterize with different health system structure compared to western neighbours. Post-communist countries spend less money on health, their population health status is lower and more unevenly distributed.

INTRODUCTION

The World Health Organization defines the objectives of the healthcare system as[1]:
• improving public health,
• responding to people's expectations,
• providing financial protection from disease-associated expenses.

Improving the public health can be understood in a literal way - the main objective of the scheme is to make people live longer and with less burden of diseases. However there should be distinguish two aspects of good public health: maximizing average level of health in the population (goodness) and minimizing the differences between the health status of individuals or social groups (fairness). Responding to the needs of individuals means meeting the non-medical needs of patients, such as treatment with respect, ensuring confidentiality and equal treatment regardless of socio-economic status[2]. Financial protection is fulfilled by minimizing the necessity of incurring catastrophic expenses from the point of view of the patient due to ill-health or accident.

[1] WHO, *The World Health Report 2000. Health systems: Improving Performance*, Genewa 2000, s. 8.
[2] Ibidem, s.9.

1 DEFINITION OF HEALTH INEQUALITY

Literature indicates a significant correlation between the degree of social inequality and the level of health [3]. In the case of health inequality can be distinguished in terms of positive and normative. Inequality in the positive sense (health inequalities) is variations in health status, health care access and use, and other health indicators, between individuals and groups. Inequality in the normative sense (health inequities) that are health inequalities deemed to be unfair, or which stem from some form of social injustice[4].

Another criterion for division of inequality may be the direction of diversity within the community. Equality in the horizontal sense indicates that people with the same health needs are treated in the same way, independent of their individual characteristics such as income, place of residence, race, religion, etc. ("equally equal")[5]. Equality in the vertical sense means different treatment of those who differ in ontogenetic characteristics.[6] Vertical equality means that the degree of use of health services depends on, among others, health. Ill people use healthcare system in a greater extent than healthy ("different in a different way").

2 HYPOTHESIS

Change of economic and social system, which placed in European countries belonging to the so-called. The Eastern bloc in the late 80's and 90's of the twentieth century caused a significant negative change in the protection of the health of citizens. Country which had been supplying so far-reaching package of social benefits for residents restrict its activities in this field. Private healthcare starter to function on a larger scale. Consequently, the changes created significant variation in access to health service.

The purpose of this article is to determine how post-communist countries differ from countries called Western Europe in the functioning of health care, particularly in terms of inequality effects. Authors suppose that post-communist countries have higher levels of inequality.

3 METHODS

The object of the research is performance of healthcare systems in selected countries. The research group are European OECD[7] countries, which were divided into two subgroups. First subgroup A are countries that have undergone political transformation in the last decade of

[3] Np. J. Beckfield, N. Krieger, *Epi + demos + cracy: Linking political systems and priorities to the magnitude of health inequities – evidence, gaps, and a research agenda*, Epidemiologic Reviews 31 (2009), p. 152-177;
I. Kawachi, B.P. Kennedy, *The Health of Nations: Why Inequality is Harmful to Your Health*, The New press, Nowy Jork 2002.

[4] Np. M. de Looper, G. Lafortune, *Measuring Disparities in Health Status and in Access and Use of Health Care in OECD Countries*, OECD Health Working Papers, No. 43, OECD Publishing 2009. p. 42.

[5] E. van Doorslaer, C. Masseria, *Income-Related Inequality in the Use of Medical Care in 21 OECD Countries*, OECD Health Working Papers, No. 14, OECD Publishing 2004, p. 8.

[6] A.J. Culyer, *Need: The idea won't do—But we still need it*, Social Science & Medicine, Volume 40, Issue 6, March 1995, Londyn, p. 727.

[7] Luxembourg was removed from group B as dissimilar from the rest of the countries (very rich small state with a per capita GDP almost twice more than other countries) and Turkey as quite different from other countries in terms of economic development.

the twentieth century. The second subgroup B are so-called the Western Europe State. The restriction in studies to these countries allowed to use the OECD database and ensures comparability of the indicators which were analysed. Most of data used in this article was obtained from OECD Health Data[8] and Eurostat[9] database for year 2008. Data for calculating the S10 and LE10 indicators are derived from Human Mortality Database[10].

In this study indicators which illustrate healthcare system resources were used (total health expenditures THE [USD PPP] [% of GDP]), the number of doctors and hospital beds per 1000 inhabitants), health effects (LE, participation in the population of people with a high level of health, infant mortality) and measures of health care diversity (barriers to access to health services, the concentration index of health care spending and the level of health in income groups, the variation coefficient of the death moment).

In the study there was also used measure of inequality distribution level of health in the population - the concentration index which is a generalized extension of the Lorenz curve and Gini index. It is cumulative distribution function for people with a good level of health which is confronted with the cumulative distribution of incomes. A graphical representation of the concentration ratio corresponds to the difference between the function showing the cumulative participation of people with a good health level together with rising incomes and the function y = x.

Concentration ratio for the range of incomes can be expressed by the formula[11]:

$$CI = \sum_{i=1}^{n-1} (p_i L_{i+1} - p_{i+1} L_i),$$

Where signs in the formula means:

p_i – cumulative participation of people in the i-th income quantile ($p_i = \frac{\sum_{t=1}^{i} N_t}{\sum_{t=1}^{n} N_t}$),

L_i – cumulative participation of people who for example have a good level of health in the i-th income quantile

$$L_i = \frac{\sum_{t=1}^{i} N(\text{feature})_t}{\sum_{t=1}^{n} N(\text{feature})_t}.$$

$N(\text{feature})_t$ – number of persons having the desired feature (eg. good health) in *t* - income quintile.

One of the simplest version of the index implies an analysis of the health benefit consumption within income groups and the research whether there are inequalities in this society section It appears that in OECD countries people of lower income centiles use healthcare system on a

[8] http://stats.oecd.org
[9] http://epp.eurostat.ec.europa.eu/portal/page/portal/health/public_health/data_public_health/database
[10] http://www.mortality.org
[11] O. O'Donnell, E. van Doorslaer, A. Wagstaff, M. Lindelow, *Analyzing Health Equity Using Household Survey Data. A Guide to Techniques and Their Implementation*, The World Bank, 2008, Washington, p. 98.

greater degree. In contrast, in developing countries, consumption of health services is the domain of wealthy individuals[12].

This simplified approach does not consider the higher needs of the poor resulting from worse health than wealthier people. After taking into account the health condition usually turns out that healthcare systems do not favour the poor, but affluent people, because in relation to their health condition, they consume more benefits than people with lower incomes.

As part of the healthcare system equality paradigm can be considered also the relative financial contribution of individual citizens. Vertical equality means that those who have a greater ability to pay should pay more than those with less capacity. In research this translates into studying the distribution of healthcare system financing between income or social groups. A common measure is the Kakwani index based on the concept of Lorenz curve, but as analysed variables are taken individual income and financial contribution to healthcare system. A positive (negative) index means the progressivity (regressivity) of the health system financing, which can be understood as disproportionate to the revenue contribution of the wealthier (poorer) to the system. Progressivity of the system mainly depends on the healthcare systems financing method - the most progressive are direct taxes while the least progressive are out-of-the-pocket payments, between them are social and private insurance.[13]. In this article was used a simplified expenditure regressivity index comparing the share of healthcare expenditure in total consumption in the group of the worst (first and second income quintile[14]) and best earnings (fifth quintile).

$$Z = \frac{\max(U_1 : U_2)}{U_5} * 100\%$$

Another measure of the inequality may be dispersion of population mortality. It is calculated as the standard deviation of life expectancy. R. D. Edwards and S. Tuljapurkar[15] used the measure as one of the first research, and now it has been accepted as one of the indicators used by the OECD.

Usually, due to very high contribution of neonatal deaths to variance, index is calculated for people who survived 10 years (S_{10}), what allows to increase the usefulness of the test indicator. S_{10} is relatively simple to calculate indicator, because the researcher need only have mortality table. The indicator can be used to compare subpopulations among themselves, but it also allows for the calculation of inequality within a population, using only one mortality table. The standard deviation measures both the whole population intergroups differentiation and intragroups[16]. In article was used modified indicator based on S10 – volatility index (S10/LE10). It allows to show relative instead absolute dispersion.

[12] F. Castro-Leal, J. Dayton, L. Demery, K. Mehra, *Public Spending on Health Care in Africa: Do The Poor Benefit?*, Bulletin of the World Health Organization, Vol. 78, No. 1, January 2000, p. 70.
[13] A. Wagstaff, E. van Doorslaer, *Equity in the finance of health care: some further international comparisons*. Journal of Health Economics 18 (1999), p. 263.
[14] Authors used maximum of U_1 and U_2 instead of only U_1 because health in some cases is not the first need and could be treated as luxury good, therefore the lowest quintile spends relative more money for primary needs like shelter, food. (*to poor to pay for health service*)
[15] R.D. Edwards, S. Tuljapurkar, *Inequality in Life Spans and a New Perspective on Mortality Convergence Across Industrialized Countries*, Population and Development Review 2005, 31(4), p.645.
[16] ibid., p.645.

4 THE RESULTS

Countries in the A group engage significantly smaller part of financial resources to the healthcare system both in absolute and in relative terms. Contemporaneously they have more technical resources measured by the number of beds per 1000 inhabitants and a smaller number of medical personnel. These are the most likely effects of socialist governing healthcare systems policies which was focused on large health care entities - hospitals. All differences between the groups are statistically significant - p-value is less than 10%.

Table 1. Health system resources

A	**THE 2008 [USD PPP/capita]**	**THE [%GDP]**	**Beds/1000**	**Doctors/1000**	**B**	**THE 2008 [USD PPP/capita]**	**THE [%GDP]**	**Beds/1000**	**Doctors/1000**
Czech Republic	1 838,5	7,1	7,2	3,5	Austria	4 128,5	10,4	7,7	4,6
Estonia	1 330,8	6,1	5,7	3,3	Belgium	3 714,3	10,1	6,6	2,9
Hangary	1 495,5	7,2	7,1	3,1	Denmark	4 052,3	10,3	3,6	3,4
Poland	1 264,7	7,0	6,6	2,2	Finland	3 158,3	8,4	6,5	2,7
Slovakia	1 859,2	8,0	6,6	3,0	France	3 809,1	11,1	6,9	3,3
Slovenia	2 450,9	8,4	4,8	2,4	Germany	3 963,0	10,7	8,2	3,6
					Greece	2 723,7	9,1	4,8	6,0
					Iceland	3 570,9	9,1	5,8	3,6
					Ireland	3 784,0	8,8	4,9	3,2
					Italy	3 058,7	9,0	3,8	4,2
					Netherlands	4 240,7	9,9	4,7	3,7
					Norway	5 229,8	8,6	3,5	4,0
					Portugal	2 508,2	10,1	3,4	3,7
					Spain	2 971,3	9,0	3,2	3,5
					Sweden	3 644,1	9,2	2,8	3,7
					Switzerland	4 929,5	10,7	5,2	3,8
					United Kingdom	3 280,6	8,8	3,4	2,6
Mean	**1 706,6**	**7,3**	**6,3**	**2,9**	**Mean**	**3 692,2**	**9,6**	**5,0**	**3,7**
S. dev.	**441,8**	**0,8**	**0,9**	**0,5**	**S. dev.**	**722,2**	**0,8**	**1,7**	**0,8**
p-value	**0,0%**	**0,0%**	**8,4%**	**3,9%**					

Source: own research based on data from Eurostat and OECD

Also, the situation of post-socialist countries compared to Western Europe is worse in level of health. While the standard measure of health - life expectancy in both groups was comparable (75.7 and 80.5), the differences between the groups are statistically significant, but the share of people who declare good or very good health level is significantly different (57 and 80%). This is even more evident in the case of studying not the whole population but only the people over 64 years of age. In that case countries belonging to group A declare a high level of health only in 7%, while in other countries almost every 5 respondents (19.5%).

Table 2. Health status

A	infant mortality	LE	GOOD HEALTH	Ghealth 65+	B	infant mortality	LE	GOOD HEALTH	Ghealth 65+
Czech Republic	2,8	77,3	60,5	7,8	Austria	3,7	80,5	68,7	16,7
Estonia	5,0	73,9	53,4	6,2	Belgium	3,7	79,8	73,3	20,8
Hangary	5,6	73,8	54,1	6,4	Denmark	4,0	78,8	73,9	25,5
Poland	5,6	75,6	56,4	4,6	Finland	2,6	79,9	68,0	16,2
Slovakia	5,9	74,8	58,3	5,5	France	3,8	81,0	68,3	14,5
Slovenia	2,4	78,8	58,2	11,5	Germany	3,5	80,2	63,9	16,2
					Grece	2,7	80,0	75,5	17,5
					Iceland	2,5	81,3	80,3	21,6
					Ireland	3,8	80,1	83,8	27,8
					Italy	3,3	81,8	62,8	10,5
					Netherlands	3,8	80,3	77,1	25,2
					Norway	2,7	80,8	76,0	25,1
					Portugal	3,3	79,3	47,4	4,4
					Spain	3,3	81,3	72,3	15,3
					Sweden	2,5	81,2	77,9	24,4
					Switzerland	4,0	82,2	80,7	26,1
Mean	**4,6**	**75,7**	**56,8**	**7,0**	United Kingdom	4,7	79,8	79,5	24,3
S. dev.	**1,5**	**2,0**	**2,7**	**2,4**	**Mean**	**3,4**	**80,5**	**72,3**	**19,5**
p-value	**1,7%**	**0,0%**	**0,0%**	**0,0%**	**S. dev.**	**0,6**	**0,9**	**8,8**	**6,4**

Source: own research based on data from Eurostat and OECD

Level of inequality in A-group countries is higher than in group B, but the tendency is not so significant like in former indicator. Share of population reported access barriers to healthcare was higher in A group (3,2% vs 1,7%) but it wasn't significant at α=10%. Regressivity index is comparable (no statistical significant differences). Concentration index of good health by income groups is higher in A countries so is volatility of time of death.

Table 3. Health inequality

A	Reported access barrier [%pop]	Regr. index	CI GHEALTH	S10/LE10	B	Reported access barrier [%pop	Regr. index	CI GHEALTH	S10/LE10
Czech Republic	0,7	121%	0,11	20%	Austria	0,8	91%	0,08	19%
Estonia	7,3	175%	0,19	26%	Belgium	0,5	167%	0,09	20%
Hungary	3,4	144%	0,06	23%	Denmark	0,6	108%	0,05	20%
Poland	6,3	138%	0,06	22%	Finland	0,8	140%	0,08	20%
Slovakia	1,4	135%	0,08	21%	France	1,9	93%	0,04	20%
Slovenia	0,2	93%	0,11	21%	Germany	2,3	50%	0,08	19%
					Greece	5,6	120%	0,06	0%
					Iceland	1,8		0,04	18%
					Ireland	1,8	70%	0,05	19%
					Italy	5,3	132%	0,06	18%
					Netherlands	0,2	93%	0,06	18%
					Norway	1,4	117%	0,04	18%
					Portugal	1,1	200%	0,12	20%
					Spain	0,3	105%	0,07	19%
					Sweden	2,5	150%	0,06	18%
					Switzerland	0,1		0,04	18%
Mean	**3,2**	**134%**	**0,10**	**22%**	United Kingdom	1,2	75%	0,06	19%
S. dev.	**3,0**	**27%**	**0,05**	**2%**	**Mean**	**1,7**	**114%**	**0,06**	**18%**
p-value	**12,8%**	**26,6%**	**1,7%**	**0,0%**	**S. dev.**	**1,6**	**39%**	**0,02**	**0,05**

Source: own research based on data from Eurostat, OECD and Human Mortality Database

CONCLUSIONS

Authors proved that post-communist countries show significant differences from Western-Europe. Health systems in group A are underfinanced when compared to B group, but they have more hospital beds and less medical personnel. It may be consequence of former political system preferring larger entities in economy (enterprises, hospital) and not small firms and ambulatory care. There is a strong differences both in health status as in healthequality both in favour of B group. In contrast to authors expectations there is no significant differences in out-of-pocket payments, in both groups system is generally regressive meaning the poorer households pay larger share of consumption for medical services and goods than the well-off ones. The distribution of health among population is more evenly in Western countries than in post communist. All of it shows that even twenty years after the transformation post-communist countries (even the most economic advanced – OECD members) still differ substantially from their western neighbours.

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Data banks

http://stats.oecd.org
http://epp.eurostat.ec.europa.eu/portal/page/portal/health/public_health/data_public_health/database
http://www.mortality.org

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