Are Health Systems of Central European Countries the Least Efficient? A Cross Country Comparative Study

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Abstract:

   The paper considers the characteristics of efficient health systems. First, indicators describing the health status of the population, then the determinant factors, finally their ratio was considered as the indicator of health system efficiency.   The analysis indicates that Israeli health system is the most efficient one, while the Czech Republic and Hungary ranked the lowest. The high level of efficiency may not stem from either expanded market elements (U.S.) or public financing and ownership (Czech Republic, Hungary) but may be enhanced by integrating statutory and private health insurance that contains market elements and operates with a few, competing insurance funds.

Key Words: *Health Systems, Central European Countries, Economic Efficiency*

JEL Classification: *I10, I11, I18*

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1. Introduction

The last two decades have witnessed an expansion of the welfare system that strained state budgets of developed countries. Health system is the largest and most critical subsystem of the public sector in terms of its economic and social impacts. Because of population ageing, rapid advances in medical and other health-related technologies (i.e. biotechnology) and rising public expectations, health expenditures of OECD countries have increased dramatically over the past few decades from 5% of the GDP in 1970 to almost 9%. Health spending grew 1.7 times faster than GDP from 1997 to 2002, whereas between 1992 and 1997 it remained unchanged.

According to Hall and Jones (2007) by the middle of the century health shares will exceed 30% of the GDP in the US. The authors developed a model based on standard economic assumptions: as people get richer and consumption rises, the marginal utility of consumption falls, the marginal utility of life extension does not decline and health share grows along with income. To face these challenges, health policy makers have to focus not only on how to ensure financial sustainability but also on the moral dimensions of health care, such as solidarity and equality. The current task for developed countries includes ensuring equitable access to services, public financing of about 60-70% of health expenditures and improving performance while providing high-quality health care services for all citizens. All of these should be accomplished without a significant growth in public health expenditures.

The health systems of developed nations differ widely in their methods of providing coverage, financing, improving outcomes, procuring resources, reducing costs and also in their design and institutional arrangement. Income distribution is different in each economic model. For countries following the rules of the social market economy (e.g. Germany, France, and the Netherlands) the main goal is to reallocate income by social means, at a cost of significant income centralization in the form of taxes or premiums. In contrast, in the normative - plural economic model (e.g. the U.K., the U.S., and Ireland) the welfare state is less extended (residual) so the basis of reallocation is efficiency, and the goals are determined in a normative way. Since values, traditions and institutions differ throughout the world there is not a single ideal health care system.

It is a central issue to detect which health system is the most efficient one. There is a massive literature on the performance of health care institutions. Their typical features are of three kinds: quality, accessibility and cost dimensions. The indicators of performance were developed by the WHO (World Health Report, 2000), the OECD (Kelley and Hurst, 2006), the EU (ECHI, 2005), the Commonwealth (2004) and by the nations, e.g. the UK (Healthcare Commission, 2007-2008) and Germany (Gesundheit in Deutschland, 2006).

Thus, if the most efficient health systems can be detected, then their common elements can be determined and the most appropriate model can be designed. For that reason, a cross-country comparative study on the efficiency of different health systems was undertaken.

2. Results and Discussion

The seven analyzed countries were: the U.S., U.K., Germany, the Netherlands, Israel, the Czech Republic and Hungary. According to the Lalonde report (1974) the health field can be broken up into four broad elements: human biology, environment, lifestyle and health care organization.

Following this grouping, human biology was not considered in this paper since we consider it objectively not measurable and the framework of this study is that the efficiency of health care organizations - as one of the determinants of health status - can be calculated by contrasting the health indicators and the determining factors (variables) and the ratio could give us the health system coefficients.

In the present study, first attempts have been made to find the potential ways of measuring the efficiency levels of health systems, followed by an evaluation and ranking of the current efficiency levels, and finally it has been assessed whether there was a correlation between the institutional arrangement (originating in the social history of the countries) and the current level of efficiency. If such causative factors could be identified, a quasi-ideal health system might be designed.

In the first part of the study, indicators of the health status (as outcome of health system) and the factors (variables) that are determining it most significantly have been identified and evaluated. Based on the results, efficiency rankings have been made.

The aim of this paper is to determine which is the most efficient health system that could serve as a model for the world. In other words, the paper will examine which health system gives the best health status compared to the given determinant factors.

The main hypothesis of this paper has been that in western civilizations better relative health status can be expected when:

- the country is less polluting (water, air pollution levels are lower),
- more unsaturated lipoids are consumed (fishes, vegetables, fruits etc.),
- less people are overweight,
- there are less conflicts as a result of family affection, religious faith and avoidance of unhealthy habits like tobacco and alcohol use,

- the institutional system is well functioning and it is perceived as such,
- the level of per capita public expenditure on health is high,
- the level of competition is high between health insurance funds and health services providers,
- the system is based on reciprocity and mutuality together with market elements.

First an attempt has been made to select the indicators of efficiency then the determinant factors have been identified and evaluated. The better performing country has been given 100 points and all the others have been related to it.

3. Measuring Health Status

There is no consensual method for measuring the health status of a population. The most frequently used indicators are life expectancy at birth, standardized death rate, infant mortality, healthy life expectation or premature death, etc. To evaluate and compare the health status of citizens, four indicators have been used in this study:

- life expectancy at birth, (World Health Statistics, 2010),
- healthy life expectancy (World Health Statistics, 2010),
- cancer mortality, (WHO Health statistics and health information systems)
- cardiovascular mortality, (WHO, Health statistics and health information systems)

In industrialized countries cardiovascular diseases are the most common causes of death followed by cancer mortality. In the early 21st century about 10 million new cancer incidences can be expected yearly, and 6 million death of cancer worldwide, whereas the same two indicators in the 1980s were only 6 and 4 million.

4. Determinants of Health Status

The four groups of the determinant factors of health status are: natural, social, political-economic and demographic.
- *Nature-related determinants*: air and water pollution, e.g. emission of CO_2, SO, and other chemicals, (World Bank data catalogue),
- *Social determinants*: individual unhealthy activity, such as smoking (World Bank, NHP statistics), alcohol use (OECD,

health data 2010), and unhealthy diet (Faostat). Lack of physical activity and as a consequence obesity (WHO Global database on Body Mass Index), and finally religious faith (Zuckerman 2007) as a social determinant of health.

-   *Political-economic determinants*: politicians may decide on full coverage and high statutory funding of health care or alternatively, many people might be without insurance coverage and the public share of health expenditure can be low (general government expenditure on health, (WHO, Global Health Observatory Data Repository). Insurance companies may be monopolist organizations or oligopoly, competitive or fund holding, etc., and the other one is the institutional system here measured as trust in political institutions (European Values Study and Arian et al. 2010);
-   *Demographic determinant*: ageing population - changing active/inactive rate measured by the ratio of 65 and older (UN World Population Prospects, 2010).

4.1 Nature Related Factors

Among quantitative elements of nature-related indicators, environment pollution has been analyzed and countries were given a score. Indicators were per capita methane, N2O, CO2, and other greenhouse gas emissions and emission of organic pollutants to the water.

4.2 Social factors

The social determinants of health status are very complex. According to the WHO, the social factors of life style include diet, physical activity, tobacco, alcohol and drug abuse. These factors have a significant impact on the occurrence of cancer and other diseases.

The three basic dimensions investigated in the study have been life style, faith, tobacco and alcohol use.

Life style: statistical data on diet (fruit, vegetable, sugar and animal fat consumption) have been used, and obesity data have been applied since on physical activity itself no comparable data for all the countries were found. Obesity has been considered because it indicates the amount of physical activity.

Religious faith: the quantity of some hormones may be influenced by the psycho-neuro-immunological impacts of faith by improving the activity of those areas of the brain which are responsible for the operation of nerves and so helping the production of immuno-functional hormones. These factors could contribute to a more efficient immune system. Many experts have examined whether priest's help, prayers, and spiritual support could improve recovery and have found that religious people are healthier and could expect longer life, even if age, weight, scholarship,

income, marital status and smoking habits are weighted. Some researches show more rapid recovering and less frequent suicide among religious people. The rate of atheists, agnostics and non-believers have been considered based on the research findings of Zuckerman (2007) on a presentation of the findings of the most recently available surveys concerning rates of non-belief in God in various countries worldwide.

Tobacco and alcohol use: Smoking contributes the most for many chronic diseases, e.g. lung cancer, COPD, coronary heart disease and oral carcinomas. Worldwide, one of the most frequent causes of death is lung cancer. The consequences of alcohol use are cancer (liver, pancreas, colorectal and oral), cardiovascular diseases, neurological and psychiatric problems. Data available about tobacco use and alcohol consumption (liter per year) have been evaluated.

4.3 Political-economic factors

We believe that it is the question of political will how much money is spent on health care, which was measured by the share of public health expenditures, secondly the quality of the operation of the political institutional system was considered. It was quantified as the trust in the government, political parties, parliament and civil services.

4.4 Demographic factor

As health care costs of an aging population are higher and because in such a population the inactive/active group ratio is increasing, a score was given to indicate the ratio of 65 years and older in the total population. Table 1. depicts the primary data indicating health status and its determinants.

Table 1. Health status and its determinants (primary data, 2008 or latest year available)

Health status and its determinants /Countries	CZ	DE	HU	IS	NL	UK	USA
HEALTH STATUS							
Life expectancy at birth (years)	77	80	74	81	80	80	78
HALE (years)	70	73	66	73	73	72	70
Cancer mortality (estimated deaths per 100.000 population)	287.3	261.1	328.5	142.1	250.3	266.5	193.7
Cardiovascular mortality (estimated deaths per 100.000 population)	539.6	462.8	651.3	160.5	298.2	377.2	305.4
DETERMINANTS							
Air pollution							
CO_2 emission per cap Mt	11.2	9.8	5.7	10.0	10.3	9.4	19.3
Methane/capita (kg/capita)	1102.9	823.1	773.8	481.1	1297.7	1078.9	1802.5
NO_x/capita (kg/capita)	8516.4	688.8	693.5	245.4	891.0	584.6	1043.1

Table 1. Health status and its determinants (primary data, 2008 or latest year available) (cont'd)							
Health status and its determinants /Countries	**CZ**	**DE**	**HU**	**IS**	**NL**	**UK**	**USA**
Other GHG (kg/capita)	107.5	384.2	154.6	271.0	229.0	170.6	787.7
Water pollution							
Emission of organic water pollutants, (kg/day/worker)	0.13	0.14	0.15	0.18	0.18	0.17	0.14
Obesity, overweight (% of adult population)	51.7	49.2	53.2	61.9	39	61	66.3
Diet							
Fruit consumption (kg/cap/year)	70.7	88.0	85.0	139.3	136.4	127.2	111.0
Vegetable consumption (kg/cap/year)	74.9	94.5	110.1	178.3	103.3	91.8	127.6
Sugar consumption (refined equivalent.) kg/cap/year	29.7	38.2	29.9	21.4	40.9	31.3	30.1
Animal fats (g/cap/day)	20.2	33.8	40.4	3.0	18.2	15.6	12.2
Religious faith (%, atheist, agnostic, non-believer)	54-61	41-49	32-46	15-37	39-44	31-44	3-9
Smoking prevalence (% of population)							
Men	34.8	37.2	45.4	30.5	33.3	26.1	25.5
Women	27.2	25.7	35.3	18.5	27.6	23.5	19.3
Alcohol use (litres per capita, over 15 years)	12.1	9.9	12.6	2.5	9.6	10.8	8.7
General government expenditure on health (as % of total expenditure on health)	80.2	75.7	69.6	58.9	77.3	83.6	48.6
Trust in political institutions (%)							

Table 1. Health status and its determinants (primary data, 2008 or latest year available) (cont'd)							
Health status and its determinants /Countries	**CZ**	**DE**	**HU**	**IS**	**NL**	**UK**	**USA**
Civil services							
a great deal	2.1	2.4	4.4	n.a.	1.7	3.7	11
quite a lot	19.8	37.1	45.3	n.a.	35.7	42.2	43.9
not very much	64.4	50.7	38.2	n.a.	55.7	44.2	37.5
none at all	13.7	9.8	12.2	n.a.	6.8	9.8	7.5
Parliament							
a great deal	1.7	4.7	4.1	54	4.7	4.3	6.5
quite a lot	10.5	29.9	29.9	n.a.	50.7	31.2	31.6
not very much	56.1	50.4	43.9	n.a.	39.8	49.3	49.2
none at all	31.7	15	22.1	44	4.9	15.2	12.7
Government							
a great deal	1.2	1.1	9.8	n.a.	0.8	5	8.1
quite a lot	29.5	22.9	33.9	n.a.	26.3	28.7	29.7
not very much	48.3	54.4	35.8	n.a.	52.8	45.4	46.9
none at all	21.1	21.6	20.4	n.a.	20.1	20.8	15.3
Political parties							
a great deal	3.5	1	2.9	28	0.7	2	4.1
quite a lot	26.6	12.9	17.3	n.a.	22.6	15.9	18.5
not very much	49.4	68.1	45.2	n.a.	58.2	57.2	59.6
none at all	20.6	18.1	34.5	72	18.5	25	17.8
Rate of 65 years and older (%)	14.8	20.4	16.5	10.4	15.3	16.6	13.1

Source: data from WHO, WB, OECD, FAOSTAT, Zuckerman, EVS, UN, Israel Democracy Institute

Table 2. Health care system efficiency

HEALTH STATUS AND ITS DETERMINANTS /COUNTRIES	CZ	DE	HU	IS	NL	UK	USA
HEALTH STATUS (GOALS)							
1. Life expectancy at birth	95	99	91	100	99	99	96
2. Healthy life expectancy	96	100	90	100	100	99	96
3. Cancer mortality	49	54	43	100	57	53	73
4. Cardiovascular mortality	30	35	25	100	54	43	53
AVERAGE	**68**	**72**	**62**	**100**	**78**	**74**	**80**
DETERMINANTS							
1. Nature-related							
Air pollution	56	45	67	74	42	53	24
Water pollution	100	93	87	72	72	76	93
2. Social							
Obesity	75	79	73	63	100	64	59
Diet	45	45	51	100	56	58	62
Religious faith	10	13	15	23	14	16	100
Smoking prevalence and alcohol consumption	54	55	43	95	57	67	75
3. Political-economic							
General government expenditure on health	96	91	83	70	92	100	58
Trust in political institutions	88	92	95	96	97	94	100
4. Demographic							
Rate of 65 years and older	70	51	63	100	68	63	79
AVERAGE	**67**	**62**	**64**	**77**	**67**	**65**	**71**
Efficiency = GOALS/DETERMINANTS	**1.03**	**1.15**	**0.97**	**1.30**	**1.17**	**1.13**	**1.11**

Source: own compilation

The analysis indicates that the Israeli health system is the most efficient one, while Israel is followed by the Dutch and the German systems. The United Kingdom and the United States were in the middle, whereas the Czech Republic and Hungary ranked the lowest.

The health systems of the seven countries have been characterized and ranked with the aim of investigating the attributes that could stimulate or retard the efficiency of the health systems. As a result, the health systems could be characterized and grouped as follows:

- **Israel:** multi-funds, competing insurance system with significant public share.
- **Germany:** conservative, universal coverage, profession based segmentation, state directed, multi-funds insurance system.
- **Netherlands:** universal, public coverage with strong private insurance (above a fixed income level it is obligatory to have private health insurance and not allowed to join the public social insurance system), complementary health insurance is rather expanded.
- **U.K.:** quasi universal, government controlled, publicly financed, predominantly public ownership, primary care groups (competing groups of general practitioners) and competing (mainly public) suppliers.
- **U.S.:** mainly private insured system, managed care form is dominant, very limited participation of government.
- **Czech Republic:** paternalist, originating as a socialist and statutory quasi-public system, with artificially created funds which are operating in an irregular way.
- **Hungary:** originating as a socialist, statutory system, with quasi full public coverage, public ownership and suppliers, no incentives against wasting.

5. Conclusions

This analysis has found that health system efficiency is not due to either expanded market elements (U.S.) or to public financing and ownership (Czech Republic, Hungary). Efficiency may be enhanced by integrating statutory (public) and private health insurance that contains market elements and operates with a few, competing insurance funds.

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