HEALTHCARE QUALITY AND ITS EFFECTS ON GROWTH. A REGIONAL ANALYSIS

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Abstract: *The purpose of our paper is to analyse the relation between the inequalities of the healthcare system and economic growth. With respect to methodology, we focus on the eight development regions of Romania which group counties with different development levels and complementary economies. By using descriptive and comparative analyses, we aim at highlighting the discrepancies of the Romanian system considering the following indicators: life expectancy at birth (years), standardised death rate, all causes of death per 100 000 inhabitants, infant mortality, physicians or doctors (per 100000 inhabitants), dentists (per 100000 inhabitants), number of nurses (per 100000 inhabitants), available beds in hospitals, number of hospitals available in the regions and family care units.*

Keywords: healthcare quality; income; regional analyses
JEL Classification: I10; I14; I15

Introduction

The relation between the health level and income is analysed in literature from a double perspective: the former draws on studies based on the statistical analysis of various time series with the role of estimating the impact of measures taken in the medical field on income or its growth. The long-term relation between income and health is examined by Arora (2001) who had in view a number of ten developed countries. The results obtained show that population health influenced economic growth which should be an integrated part of economic productivity. Arora concludes that "within the co-integrated relation between income and health, innovations in the medical field lead to economic growth and not viceversa". (Arora, 2001, p.730) Aurora's observations are similar to the ones reported by Fogel (1994, 1997) who conducted a study of Western economies along two centuries – from 1780 to 1979. By analysing the international data during the past 25 years, Bloom and Sachs (1998) obtained empirical evidence on the important role of health and demographic variables on determining the rates of economic growth. More recent studies examined the effects of life expectancy for the following 15-25 years and found strong direct effects, as well as indirect ones

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that show in the investment rates in physical capital or the demographic profile of the population (Barro, 1997; Sachs and Warner, 1997; Bloom and Williamson, 1998). Bhargava, Jamison, Lau and Murray (2001) assessed the effects of the initial situation of health on a group of countries for five years and only found strong effects on low-income countries. A series of macroeconomic studies at international level also found evidence of a significant impact of health (measured in life expectancy) on economic growth (Mayer *et al.*, 2001; Caselli, Esquivel and Lefort, 1996; Gallup and Sachs, 2000).

The division of the world into rich and poor is not a recent one; on the contrary, various circumstances, be they historical, political or geographic have explained the structure of the world as a mosaic. The aim of our article is to highlight the inequalities of the Romanian healthcare system.

1.Literature review

The ones tackling the problem tried to prove by essays or quantitative studies that the health state influenced the individuals' level of productivity, determining the welfare level of a country. For instance, Bloom and Sachs (1998) and Gallup and Sachs (2001) obtained empirical evidence on the important role of health and demographic variables in determining economic growth rates. The authors mentioned claim that only malaria "reduces the annual growth rate of South-Asian economies by 2.6 percent, and the African one by 0.6 %"(Bloom, Sachs, 1998, p.276). Such a "magnitude implies that if malaria had been eradicated in 1950, per capita income in Sub-Saharan Africa would have been twice as much today. Should we add the effect of other diseases, the effects would be greater" (Mosora, 2009). The World Health Organisation supports the same position: "nowadays poor health has devastating effects on economic development in Sub-Saharan Africa, South-East Asia and other regions with many diseases and high poverty" and "the access to basic medical services (…) for the poorest could save millions of lives every year, diminish poverty, stimulate economic growth and promote global security"(Mosora, 2009, apud OMC, 2009). Similarly, the study conducted by Bhargava, Jamison, Lau and Murray (2001) investigated the health effects (such as the adult survival rate) on economic growth for up to five-year periods, between 1965 and 1990. The results obtained point out that "although the health of individuals in a country can only be roughly approximated in national averages, the models showed significant effects of adult survival rate (ASR) on economic growth for low income countries. Thus, for example, for the poorest countries, a 1% change in ASR was associated with an approximate 0.05% increase in growth rate. While the magnitude of this coefficient was small, a similar increase of 1% in investment/GDP ratio was associated with a 0.014% increase in growth rate" (Bhargava *et al.*, 2001, p.15). Similarly, the paper drafted by Mayer *et al.* (2001) analyses the South American countries and the Caribbean; the author found a significant

impact of life expectancy on long-term economic growth. Using the data from the two countries with different institutional structures, i.e. USA and The Netherlands, Hurd and Kaptevn (2003) concluded that both the income and the income gap are strongly related by the inequalities in the health system.

Starting from the evidence above, in our paper we aim at analysing the relation between the inequalities in the healthcare system and economic growth. As far as methodology is concerned, we focused on the eight development regions in Romania which bring together countries with different development levels and complementary economies as follows: *The North-East Region (N-E)* which comprises *Bacau, Botosani, Iasi, Neamt, Suceava* and *Vaslui county*, the *South-East region (S-E)* consisting of Braila, Buzau, Constanta, Galati, Tulcea, Vrancea; the *South Region – South (S)*: Arges, Calarasi, Dambovita, Giurgiu, Ialomita, Prahova, Teleorman; the *South – West Region (S-W)* with Dolj, Gorj, Mehedinti, Olt, Valcea; the *West Region (W)* with Arad, Caras –Severin, Hunedoara, Timis; the *North – West Region (N – W)* - Bihor, Bistrita – Nasaud, Cluj, Maramures, Salaj, Satu – Mare; *the Center Region (Center)* – Alba, Brasov, Covasna, Harghita, Mures, Sibiu and *Bucharest-Ilfov Region (Bucharest)* - Bucharest, Ilfov.

Using the descriptive and comparative analysis, our aim is to highlight the discrepancies in the Romanian system (see figure 1), considering the following indicators: life expectancy at birth (years), standardized death rate, all causes of death per 100 000 inhabitants, 3 years average 2008-2010, Infant mortality, Physicians or doctors (per 100000 inhabitants), Dentists (per 100000 inhabitants), Number of nurses (per 100000 inhabitants), Available beds in hospitals, Number of hospitals available in the regions and Family care units.

## 2.Discrepancies in the Romanian Healthcare System. An Analysis at the Regional Level

A number of studies conducted in developing countries showed an important relation between education and the state of health of the new generation measured in terms of life expectancy[1]. As proved by Howitt Peter, "an increased life expectancy has a direct effect on the training level of the population by the influence on the death rate via accidents at work that make up the effective depreciation skill rate" (Howitt, 2005, p.17). Its entire ideological foundation is based on the following equation s=$\frac{\lambda\acute{\varepsilon}(1-\acute{\varepsilon})}{\phi+\eta}$ where λ is Learning efficiency; η - Population growth rate; ϕ - Skill-adjusted death rate; $\acute{\varepsilon}$ - School attendance ($\acute{\varepsilon}$< 1/2). However, when "infant mortality is the

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[1] Life expectancy at certain ages represents the mean number of years still to be lived by a person who has reached a certain exact age, if subjected throughout the rest of his or her life to the current mortality conditions (age-specific probabilities of dying).

dominating one, and death rate at the workplace rises, the effects described above cannot be reversed. This effect may explain why so many developing countries which seemed to grow as rapidly as the developed world in the first half of the 20th century have had disappointing results ever since" (Howitt, 2005, p.17).
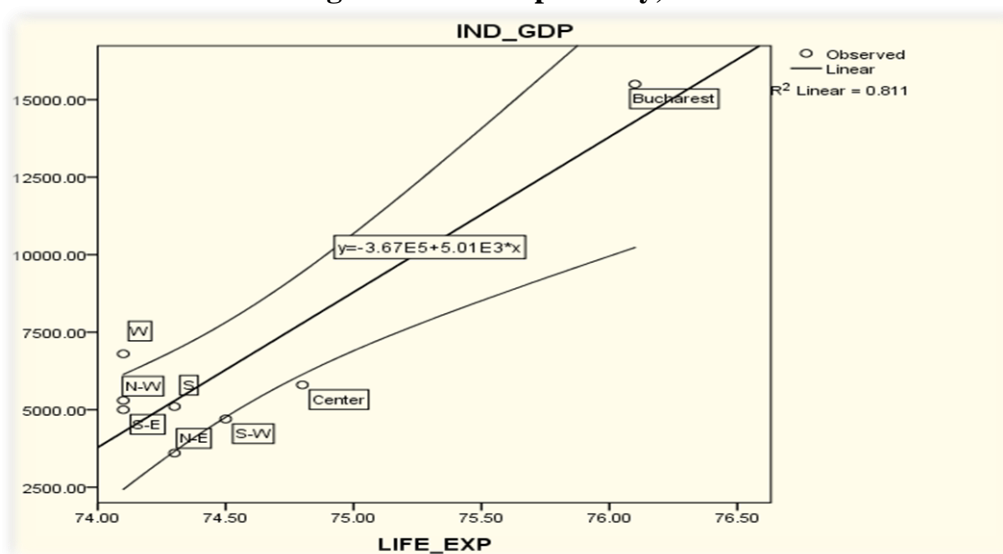
In Romania, the Bucharest – Ilfov region recorded the highest level with a life expectancy of 75.1 years, the lowest one pertaining to the North-West region.

Figura 1 - Life expectancy, 2008-2010
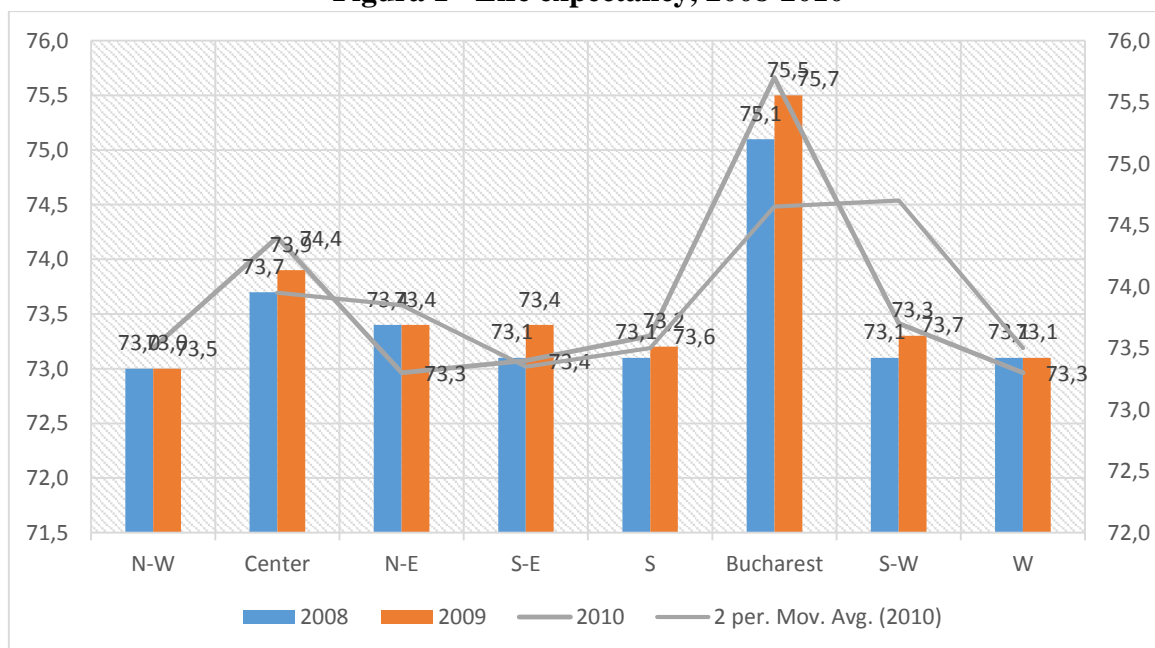
Source: Eurostat Database, NUTS 2, 2010

Figura 2 - Life expectancy, 2011

Source: Eurostat Database, NUTS 2, 2011

In Romania, the Bucharest - Ilfov region is the only one with an average life expectancy of 75.7 years in 2010, followed by the Center region with 74.4 years; the other six regions recorded average time spans below the national means that ranged between 73.3-73.7 years.

In 2011 (Fig. 2), there was an increase of the average life expectancy for all NUT2 regions in our country. The Bucharest – Ilfov region comes first with an average value of 76.1 years, followed by the Center region (74.8), South-West (74.5) and North-East one (74.3) one. The North-West, South-East and West regions hold the last three positions with a value of 74.1 years.

Figure 3 - Standardised death rate, all causes of death, per 100 000 inhabitants, 3 years average
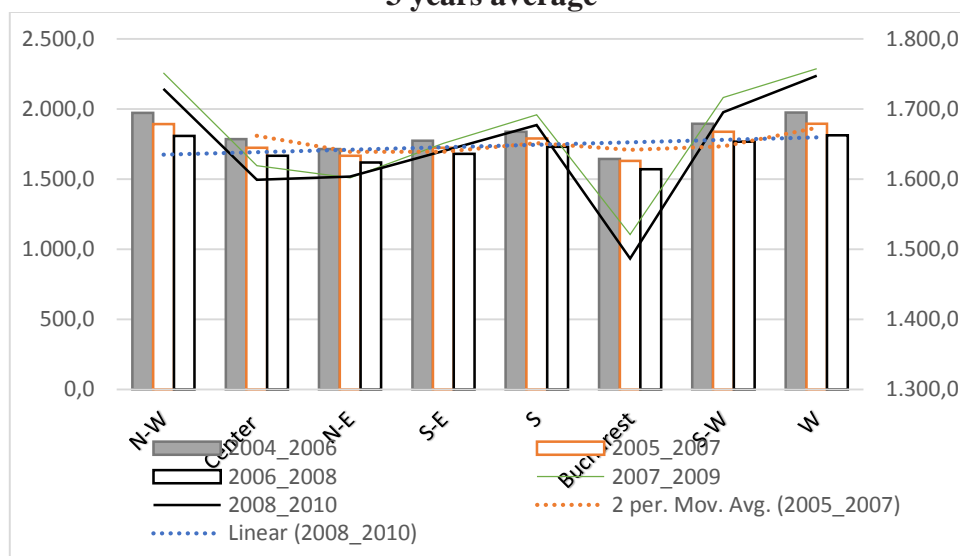
Source: Eurostat Database, NUTS 2, 2011

Figure 4 - Infant mortality, 2008-2011
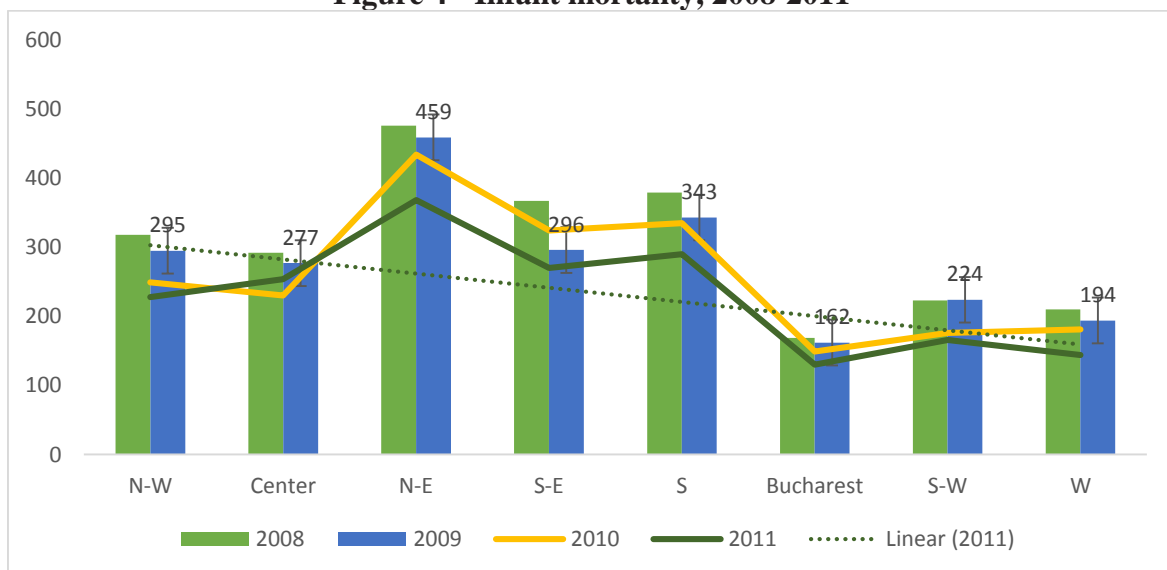
Source: Eurostat Database, NUTS 2, 2011

Figure 3 shows the values recorded by the indicator *Standardised mortality for all death causes* reported for the 100 000 inhabitants and calculated as 3-year average. The periods considered are: 2004-2006; 2005-2007; 2006-2008; 2007-2009; 2008-2010. At a regional level, the South, South-West and West regions record the highest values for this indicator, the results mainly being caused by the high levels in the Giurgiu, Teleorman, Ialomita, Mehedinti, Dolj county, the mountain area of the West region. The North-West region records a constant decrease of values, reaching values below the national means in 2007. The same holds true for the Bucharest – Ilfov region with its decreasing tendencies below the national rate. Standardised mortality for the first causes of death recorded a descending trend between 2004-2011. However, there was a rise in mortality because of chronic diseases of liver and cirrhosis, as well as the ones caused by excessive alcohol consumption. According to the National Health Strategy 2014-2020 – Health for Prosperity, "*the pattern of mortality for all the main non transmissible diseases – of the circulatory system, some cancers, cirrhosis – is generally more unfavourable in Romania than in other EU countries; the age standardised rates are two times higher than European means, and the differences more significant in the case of premature mortality (from 0 to 54 years)*"(Ministery of Health in Romania (2013, p.10).

Figure 4. shows data on infant mortality at regional level between 2008-2011. There are major discrepancies among the regions analysed so that the N-E region has the highest values, and the Bucharest-Ilfov one, the lowest. "Infant mortality is significantly higher in the urban area and at national level (7.7/1000) than in the rural one (12.3/1000 living newborn). In a series of counties (Cluj, Buzau, Dolj, Constanta, Salaj and Vrancea), infant mortality in the rural area is two or three times higher than in the urban area. Over 80% of the deaths at home in children below 5 and in the first 24 hours of hospitalisation occur in children from the rural area. Significant geographical discrepancies are also encountered in the calorie malnutrition in children from 0 to 2 with variations of the indexes reported between 0% in the Timis county and 8.2% in Mehedinti county." (Ibidem, p.22).

Regarding physicians, dentists and nurses reported per 100000 inhabitants, there are significant inequalities between regions (see Table 1).

Tabel 1 - Healthcare Workforce, 2011

| HEALTHCARE WORKFORCE			
Regions	Physicians or doctors (per 100000 inhabitants)	Dentists (per 100000 inhabitants)	Nurses (per 100000 inhabitants)
N-W	279.35	80.63	590.2698
Center	235.24	60.64	549.0157
N-E	178.44	52.40	506.8897
S-E	166.83	50.63	504.1366
S	134.82	35.48	447.4077
Bucharest	500.32	109.53	745.8491
S-W	201.44	42.04	549.2430
W	322.70	87.92	552.3962
Romania	239.2023	62.3058	612.4434

Source: Eurostat, 2011

The economic development of Romania is directly influenced by the quality of healthcare services provided to the population. Table 1 shows data on the number of physicians, dentists and nurses per 100000 inhabitants. Thus, at national level, the number of physicians recorded an annual growth of approximately 6% at the national level in 2011 as compared to the previous year. This increase particularly owed to the North-West, Center and West regions in which the number of physicians constantly grew. Out of the eight regions analysed, the Bucharest area holds the first place: in 2011 it recorded a number of 500 327 physicians per 100 000 inhabitants, followed by the West region (with a number of 322 701 physicians per 100 000 inhabitants) and the North-West region (279.351 physicians per 100000 inhabitants).

The South region holds the last place with 134.823 physicians reported for 100000 inhabitants. Therefore, it can be noticed that the number of available physicians in 3.71 times higher in Bucharest than in the South part of our country. A similar situation is also recorded in the case of dentists, where the Bucharest region holds the first place with the highest amount of the total number of physicians and dentists reported for 100 000 inhabitants (109.53 dentists for 100.000 inhabitants).

The Bucharest region also holds the first place with respect to the number of nurses reported for 100 000 inhabitants. N-W and W regions hold the following places, where a number of 590.2698 and 552.3962 nurses, respectively per 100 000 inhabitants.

Figura 5 - Healthcare activities: Number of hospitals available in the regions, Family care units and Available beds in hospitals
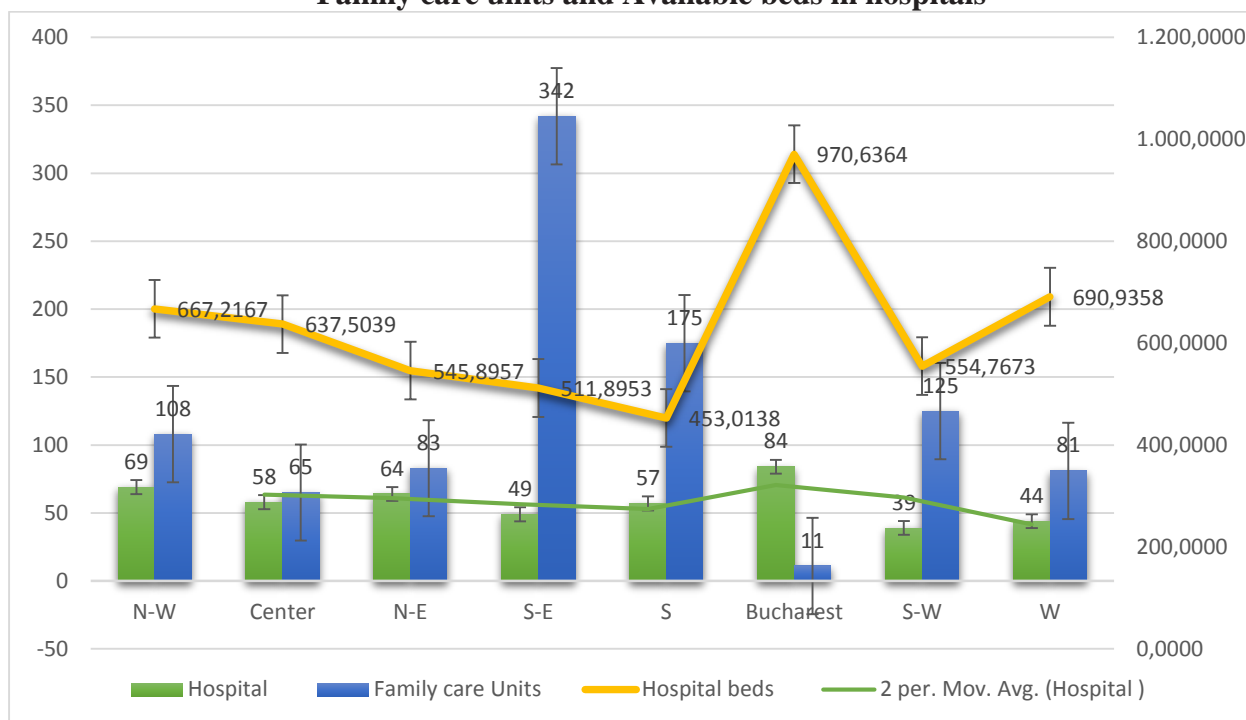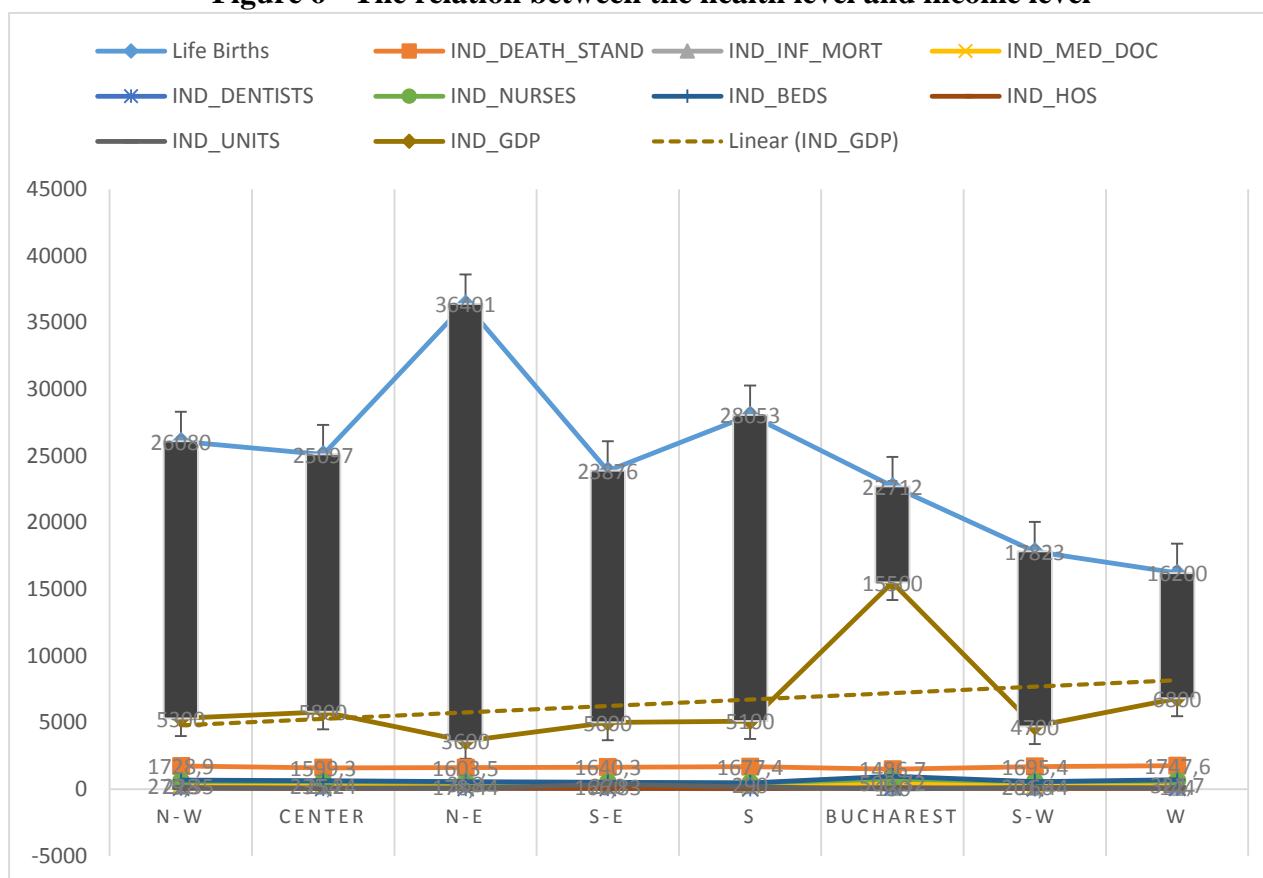

Source: Eurostat Database, NUTS 2, 2011

According to the statistical data of 2011, Romania has 464 hospitals and 990 family care units. At regional level, Bucharest (18.1%) and the North-West area (14.9%) of the country have the higher number of hospitals in the country. At county level, the Center region has the highest number of healthcare units in Brasov and Mures, and the lowest in Covasna and Harghita. After costs were cut in the healthcare system, a measure imposed by the Romanian Government in 2011, a number of 67 hospitals went bankrupt in our country, out of which eight from the Center region.

Consequently, at the end of 2011, this region remained with 58 hospitals and 108 family care units. These healthcare units were not the only ones to suffer consequences, but also the polyclinics that decreased by 27 units, health centers by 2, and general medical practices by 35, etc. The S-W region holds the last place regarding the number of hospitals of the total ones at national level (8.4%).

The situation is similar to the one of *Family care units* where Bucharest region holds the first place. The distribution of available beds varies between 970.64 available beds per 100 000 inhabitants (Bucharest) and 453.01 units available for South region.

Figure 6 - The relation between the health level and income level

Source: Eurostat Database, NUTS 2, 2011

The economic development of Romania is directly influenced by the quality of healthcare services the population enjoys. According to the graph above, the Bucharest region where the income level is the highest, indicators such as *standardised death rate, all causes of death per 100 000 inhabitants, 3 years average 2008-2010* and *infant mortality* hit rock bottom. In the same area, the number of physicians, nurses and dentists is the highest in the country. Significant differences were also noted in the number of available beds and available hospitals. Thus, we consider that without a workforce with minimum education levels and a good health, a country is incapable to maintain a continuous economic growth. Moreover, since health is an important determinant of productivity and underdeveloped countries and developing ones mainly depend on physical labour, special attention should be given to a healthier workforce to maximise productivity.

Conclusions

If we ask why the level of performance of the poor countries is low, we have a determining factor – the state of health which influences the individuals' level of productivity, thus accounting for the welfare level of a country. We thus consider that without a workforce with minimum education

levels and good health, a country is not able to maintain a continuous economic growth. Furthermore, since health is an important determiner of productivity and underdeveloped countries or developing ones roughly depend on physical work, special attention attention should be given to a healthier workforce to maximize productivity.

The analysis we conducted allowed us to note that the regions in which the state of health (measured by means of the following indicators: Life expectancy at birth (years), Standardised death rate all causes of death per 100 000 inhabitants, Infant mortality, Physicians or doctors (per 100000 inhabitants), Dentists (per 100000 inhabitants), Number of nurses (per 100000 inhabitants), Available beds in hospitals, Number of hospitals available in the regions and Family care units) was better, the associated income level has a higher level. Good health is an essential element of human welfare, representing a value in itself and a key element of human capital which, in its turn, directly influences the growth process of economic competitiveness.

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