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THE INFLUENCE OF EDUCATION AND INTERNET ACCESS ON HEALTH STATUS IN EUROPEAN UNION

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Abstract: *Health is a precondition for economic prosperity and the EU policies aim to develop sustainable health systems trying to reduce inequalities. Over the last decade, European health systems have faced growing common challenges like increasing cost of healthcare, population ageing , shortages and uneven distribution of health professionals, inequities in access to healthcare.The negative effect of these challenges on population health status can be can be diminished by discovering some factors which could improve population health outcomes and health care quality. Experts state that education is critical to social and economic development and has a profound impact on population health. Education offers opportunities to learn more about health and health risks, about how to prevent or manage diseases. Individuals with lower health literacy had poorer health-related knowledge and comprehension and ability to interpret medication labels and health messages.The increase in online health information challenges users with limited literacy skills or limited experience using the Internet. For many of these users, the Internet is stressful and even inaccessible. The goal for this paper is to analyse the influence of two of these factors - level of education and internet access to health information - on population health status.*

JEL classification: I12, I29
Key words: health status, health system, health education, internet information

1. INTRODUCTION

Health systems play an extremely important role in the development of modern society, health being a precondition for economic growth. In the European Union health systems are different but they are built on common values such as “universality, access to good quality care, equity and solidarity”. All these systems have faced several challenges in

the past years, like increasing cost of healthcare; population ageing; shortages and uneven distribution of health professionals and inequities in access to healthcare (EC, 2014). The negative effect of these challenges on population health status can be can be diminished by identifying some factors which could improve population health outcomes. In March 2014, the third European program, named *Health for Growth*, was adopted for 2014-2020 period with a budget of EUR 449.4 million, having as priorities the "link between health and economic prosperity (as the health of individuals directly influences economic outcomes such as productivity, labour supply and human capital; investment in health as a source of economic prosperity and social cohesion; societal challenges - such as demographic ageing; inequalities, burden of chronic diseases, effectiveness and resilience of health systems) (EC, 2017).

In this context this paper aim is to identify factors which could improve population health outcomes and health care quality thought analysing the influence of education attainment level and internet use for seeking health information - on population health status.

2. THEORETICAL BACKGROUND

The state of health of the population is essentially influenced by education, which plays a critical role in social and economic development (Zimmerman, Woolf, & Haley, 2015). Education offers opportunities to learn more about health and health risks, about how to prevent or manage diseases. Individuals with lower health literacy had poorer health-related knowledge and comprehension and ability to interpret medication labels and health messages (Diviani et al., 2015; Perrenoud et al., 2015).

There are authors that explained the link between education and health though three categories of factors: work and economic conditions (educated persons have jobs, in most of cases, so they have income and low economic hardship), social and psychological resources (they have a "greater sense of control over their lives and their health") and health lifestyle (Ross & Wu, 1995). The causes of the link between education and health are explained in the literature though the fact that people exist in multiple and interacting context, "these contexts are domains of social relations and environmental health and education impacts on individuals in each context at each level" (Feinstein et al., 2006).

In several articles are describe the effects of education on health status. There are analyzed effects like better health and well-being, healthier behaviors; is emphasized the fact that education reduces the need for health care, the associated costs of dependence, lost earnings and human suffering or a better understanding of health literacy (Feinstein et al., 2006; Zimmerman, Woolf, & Haley, 2015; Cesur, Dursun, Mocan, 2014; Heide et al., 2013).

There were also analyzed the negative aspects of education on health such as that more educated people are more likely to take advantage of health care provision (Feinstein et al., 2006).

Today, the Internet has become a very important source for building health knowledge so the term eHealth is becoming more and more used. eHealth represents "the use of information and communication technologies (ICT) for health and it is recognized as one of the most rapidly growing areas in health today"(WHO, 2017). The European Commission has an eHealth Action Plan 2012-2020 through which it follows to provide "smarter, safer and patient-centred health services", including a special focus on mobile health (mHealth) (EC, 2017). The education has influence on the use of ehealth (Hage et al., 2013; Ross et al., 2016), a study revealed that people with a college degree used more eHealth than people without a college degree (Amo, 2016).

3. HEALTH SYSTEMS IN SOUTH-EASTERN EUROPE

South-Eastern Europe Health Network (SEEHN) is a political and institutional forum set up by the governments of Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Montenegro, the Republic of Moldova, Romania, Serbia and the former Yugoslav Republic of Macedonia to promote peace, reconciliation and health in the region. The health component added in 2001 to the Stability Pact for south-eastern Europe (SEE), wanted to gather people from the entire region in order to improve health (WHO, 2017).

Almost thirty years ago a major concern was deteriorating population health and decreasing life expectancy in several countries of the South-Eastern Europe due to the economic collapse in the early years of transition. In these countries health reforms were described by the creation of social health insurance systems, the privatization of primary health care, and the

introduction of family medicine delivered by general practitioners (Bartlett, Božikov & Rechel, 2012).

Major health inequalities are related to poverty, financial barriers, ethnicity (Romany), geographical barriers (especially rural areas but not only) and migration. In general, the studied countries from South East Europe follow the European pattern of mortality. Diseases of the circulatory system and neoplasm are the main major causes of death in all these countries. The third major cause of death ranges from accidents and intoxications in Bulgaria and Croatia to diseases of the respiratory system in Bulgaria, Montenegro and Serbia, respectively diseases of the digestive system in Moldova and Romania (Stanculescu & Neculau, 2014).

Legislative influences are also a perceived factor in the evolution of the public health expenditure as a percentage of GDP, and even if in the medium and long term there is an increasingly tendency, the evolution is way below the European Union average. Health expenditure as a percentage of GDP in 2014 varies from: 4% in Romania, 6% in Albania, 6.5% in Cyprus, 6.9% in Croatia, 8.3% in Greece, 10% in the Republic of Moldova. In 2015, the average expenditure in south-eastern Europe countries was 6.4%. In the European Union, the share of health expenditure as a percentage of GDP is 7.2%. Health is the second largest chapter of public expenditure summing 19.2% of GDP, right after social protection.

Romania scores the lowest in terms of health services when it comes to the European Union– it is the last ranked country in the European Health Systems Index (EHCI) 2016, on 35th position from 35 positions, with 497 points. This index was used for the first time in 2005 by Health Consumer Powerhouse (HCP).

This report is considered evidence of inefficiency and outdated organization of the system. If the Dutch, Swiss, and even Italians allow themselves to be hospitalized for long period of time, Bulgaria, Romania and Albania can not support such systems and urgently need professional help to restructure their health services. Also, Romania is among the countries with the highest number of informal payments for medical services, but here the phenomenon may be under-dimensioned because the report is based on patient statements.

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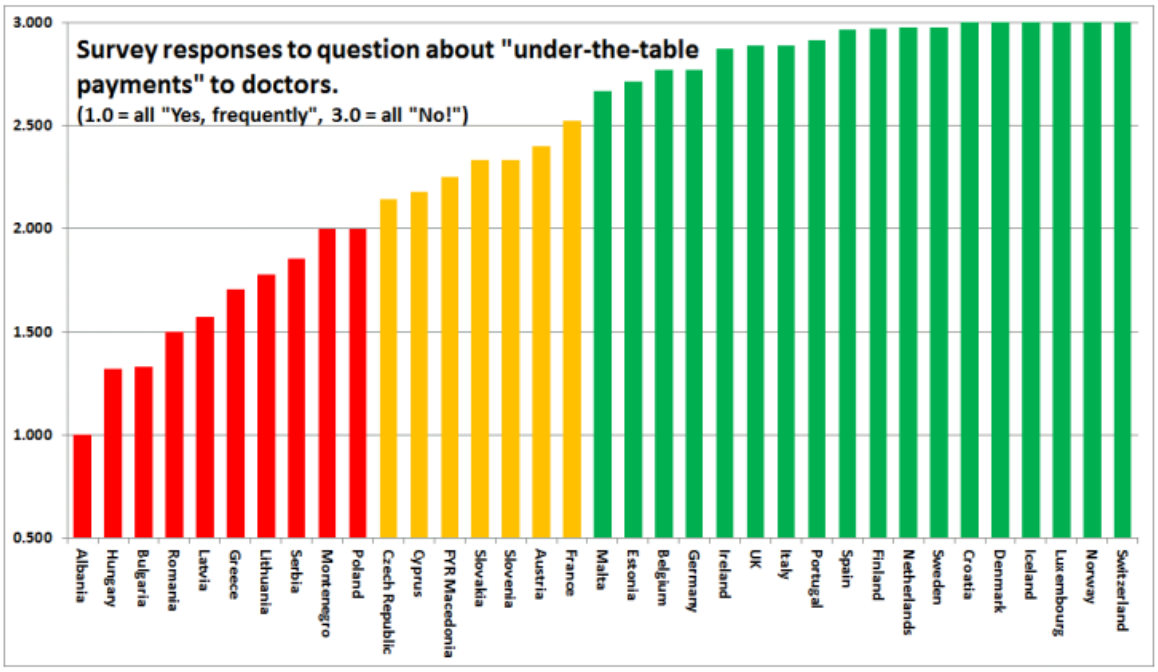

Fig.1 – "Under-the-table payments" to doctors

Source: https://healthpowerhouse.com/files/EHCI_2016/EHCI_2016_report.pdf

Accession to the European Union should have brought a change in some of these SEE countries, but these changes were more of legislative and political ones, not visible in a better health point of the targeted populations. Although efforts are being made to remove corruption from all areas, the healthcare system still has a long way to go. The most affluent groups are poor and vulnerable. There is a need for health education, especially in the countries of south-eastern Europe, where a healthy population will also reduce the cost of healthcare, which will benefit not only the state directly but, more importantly, the many families that would otherwise use that money to invest in wealth creation (Eurohealth, 2004).

METHODOLOGY AND RESULTS

The main objective for this paper is to perform an analysis of the influence of education attainment level and internet use for seeking health information on population health status in European Union and the authors chose to analyse the case of Romania.

In order to achieve the aim and the objective, the authors used 2 statistical instruments: the correlation coefficient (r) and the regression method.

The correlation coefficient (*r*) measures the strength and the direction of a linear relationship between two variables. The formula for this linear coefficient is presented below:

$$r = \frac{n\sum xy - \left(\sum x\right)\left(\sum y\right)}{\sqrt{n\left(\sum x^2\right) - \left(\sum x\right)^2}\sqrt{n\left(\sum y^2\right) - \left(\sum y\right)^2}}$$

The value of r is such that -1 < r < +1. The + and – signs are used for positive linear correlations and negative linear correlations, respectively (Petcu, 2003, pag.182).

The analysis starts from a comparison between the self-perceived health as being bad in Romania and its neighbors (Hungary and Bulgaria) and the overall European Union. Self-perceived health is, by its very nature, subjective. The authors considered important to consider the relation between this aspect of self-perceived status and education because higher education graduates reported the most positively about their health condition (Eurostat, 2017). The figure below shows that Romanian population perceives their health as being bad less than other populations.

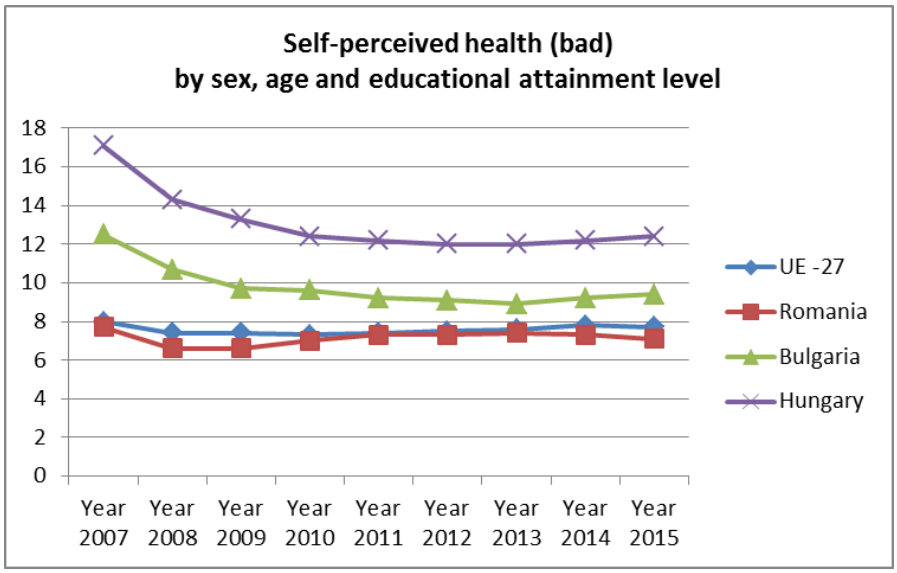

Fig.2. – Self-perceived health as being bad in EU

This perception of Romanian population, who considers themselves as being in good health more than the EU average, lead somehow to the situation in which health spending per capita is lowest in Romania compared to Luxembourg, Germany and the Netherlands (OECD, 2016).

This same perception of Romanian population on their good health status is possible to lead them to seek less information about health on the internet.

The 2 variables considered for this case are: health information searched for on the internet and self-perceived health as being bad. The authors chose these variables starting from the results of the comparison between different countries on this matter. In the table below can be seen that the percentage of people aged between 16 and 74 who use the internet for seeking health-related information is low compared to other countries: Turkey, Greece and especially Croatia.

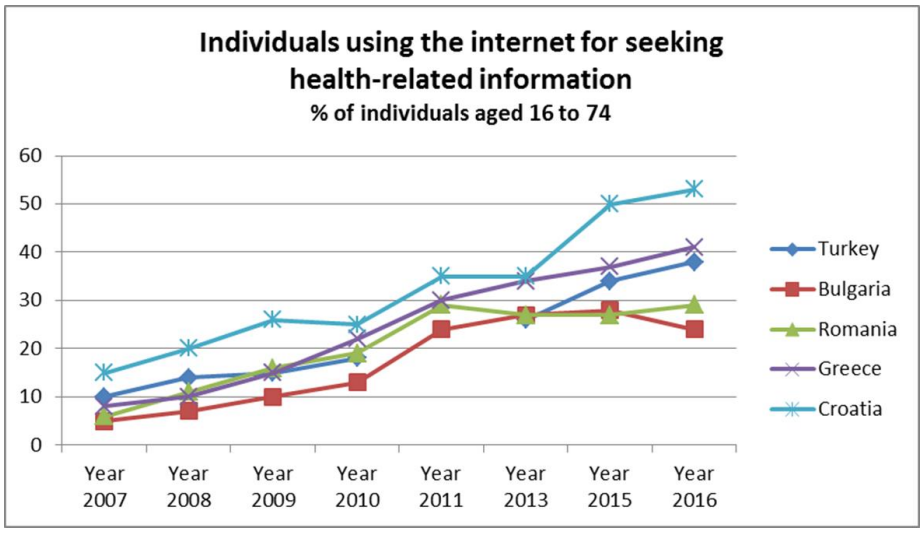

Fig.3 – Individuals using the internet for seeking health-related information

The table below contains the data available for both variables for Romania between 2007 and 2016.

Table 1. Evolution of health information seeking and self – perceived health

Years	Health information	Self-perceived Health -bad
2007	6	9,6
2008	11	8,2
2009	16	8,2
2010	19	8,6
2011	29	9,1
2012	32,4	9,2
2013	27	9,1
2014	37,0	9
2015	27	8,5
2016	29	8,9

The value of *r* in this case is 0,178300319 showing a positive correlation between the variables – seeking information about health on the internet and self-perceived health as bad, but this correlation has a very weak intensity.

This can be seen by comparing also the

For assessing the influence of education attainment and health information on the self-perceived health, the authors performed **a regression analysis**. Table 2 includes the values for the period 2007-2016 for the considered indicators.

Table 2. The evolution of indicators in Romania
between 2007 and 2016

Years	Self-perceived Health	Education attainment	Health information
2007	25,2	15046,3	6
2008	26,1	15042,3	11
2009	26,9	15028,2	16
2010	28,4	13797,7	19
2011	27,8	13726,2	29
2012	28,5	13658,1	25,2
2013	28,8	13606	27
2014	28	13526,7	27,0
2015	26,7	13403,5	27
2016	28,7	13262,7	29

The value of R Square (0.64) from Table 3 means that 64% of the variation in self-perceived health can be explained by education attainment and health information.

Table 3. Overall regression's accuracy

Regression Statistics	
Multiple R	0,804174991
R Square	0,646697417
Adjusted R Square	0,545753821
Standard Error	0,824733887
Observations	10

The Significance of F (0.026212826) from Table 4 shows that there is only a 2% chance that the Regression output was merely a chance occurrence. Since the p-value = 0.026 < 0.05 = α, the authors conclude that the regression model is a significantly good fit.

Table 4. Probability That This Output Was Not By Chance

ANOVA					
	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	8,715253664	4,357627	6,406523	0,026212826
Residual	7	4,761301892	0,680186		
Total	9	13,47655556			

Table 5. Individual Regression Coefficient Accuracy

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	33,17251633	15,18258283	2,184906	0,065167	-2,728587224	69,07361988	-2,728587224	69,07361988
Education attainment	-0,000521941	0,000961364	-0,54292	0,604035	-0,002795205	0,001751322	-0,002795205	0,001751322
Health inf	0,076197128	0,085253208	0,893774	0,401126	-0,125394675	0,27778893	-0,125394675	0,27778893

Considering the P-values (> 0.05) it can be stated that the model is valid but no variable is significantly related to the self-perceived health of Romanian population.

CONCLUSIONS

The aim of this paper was to analyse the influence of some factors on population health status in the European Union. Consulting the literature, the authors assumed that the population level of health is more influenced by 2 factors: the education attainment and the availability of information about health issues on the internet.

The authors discovered some discrepancies inside the literature on the connection between health and education. They found out that some specialists sustain that could be a strong correlation between the self-perceived status and education because higher education graduates reported the most positively about their health condition, compared to people with low education attainment. An interesting fact is that some specialists consider that a lower education attainment could lead to a better health due to the lack of financial resources for cure. So, smoking, alcohol consumption and overweight and obesity are health determinants with a higher possibility of appearance to highly educated persons who have access to financial resources.

The digital society offer to people the opportunity to seek on the internet for different information and health issues and treatments is one of them, too. A higher use of internet for seeking health information could contribute to improve the health status. Better informed patients behavior lead to: less anxious and more satisfied people who follow advice better and starts the treatment earlier. Healthcare costs drop through more self- management and more

efficient use of resources. On the other part, it is a known fact that people from less developed countries try to find solutions for cure on the internet instead of visiting a doctor, due to the lack of money.

Considering all this aspects, the authors performed an analysis for Romania, trying to evaluate its position inside this approach. The perception of Romanian population, who considers themselves as being in good health more than the EU average, is possible to lead them to seek less information about health on the internet. The calculation of the correlation coefficient revealed a positive correlation between the two variables (seeking information about health on the internet and self-perceived health as bad), but this correlation has a very weak intensity for Romanian population.

The regression analysis performed for assessing the influence of education attainment and health information on the self-perceived health in Romania also revealed that no variable is significantly related to the self-perceived health of Romanian population.

In conclusion, although education and internet access don't influence directly the health status by themselves, they could affect health status in combination with other factors, this being a subject of further research.

CONFLICTS OF INTEREST AND PLAGIARISM: The authors declare no conflict of interest and plagiarism.

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