The analysis of the main macroeconomic indicators which characterize the Romanian health system

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Abstract

Most Western countries have passed in the last decade of the twentieth century through significant changes in the health system domain, transformations which directly relate to the financial, organizational and regulatory framework. Romania, along with other European countries, joined the trend of transforming the social and health systems. The health sector is involved in one of the most substantial reforms of the entire Romanian society. In this macroeconomic context, a series of specific indicators were used to characterize the health system in Romania. We also realized an econometric analysis of the correlation between the number of physicians, the number of hospitals, beds in hospitals and the number of patients out of hospital using a linear econometric model.

Keywords: health and social care system; number of physicians; number of hospitals; number of beds in hospitals; number of patients out of hospital; econometric model.

1. Introduction

Romania's health system is not situated among the best health segments in the world, but, despite this, people must adapt at the conditions and to try to find the most effective and advantageous way to treat themselves if it’s necessary. The health of the population is a complex, social and biological phenomenon, which express the level and the characteristics of people’s health treated as a whole.

Health status is closely connected with the living standards of the population, with the consequences of lifestyle, working conditions, with the social-economic system in which they are living. Currently, the population health state
is determined by the access to health services, depending in a large extent of external factors as: genetic factors, environmental factors, economic development factors, socio-cultural factors etc. The Romanian health system is based on social insurances and aims to ensure equitable and non-discriminatory access at a basic package of medical services for the insured people. Consequently, the access to health services is a continuous concern of the Ministry of Health.

The determinant factors which are influencing the population degree of accessibility at public health services (Cicea and Pirlogea, 2009) are generally represented by poverty, unemployment, employment, occupation, the insured status in the social health insurance system, the degree of coverage with medical personnel.

In the Activity Report of the National Health Insurance House (2013) regarding the insured status in the social health insurance system is stated that in 2013 the share of persons beneficiaries of medical services packages registered on family doctors lists was 89.78%, declining compared with 2012- 94.1% in the urban area while, in the rural area, it was 75.29%, growing compared to 2012 - 74.64%; at total level being 84.95% in 2013, declining compared to 2012-85.35%.

In (OECD, 2014) report is mentioned that, in 2012, among the EU country members, for Poland, Romania and Slovenia the number of doctors per capita was the lowest, respectively 2.2 and 2.5 doctors per capita for the last two ones, at opposite pole been situated Greece with 6.2 doctors per capita and Austria with 4.9 doctors per capita.

In the Report of the Presidential Commission for the analysis and public health policy of Romania (2008) is mentioned that, beside the small number of medical personnel at the national level, there are significant geographical imbalances, respectively the concentration of human resources in the urban areas in the detriment of rural ones, the poor regions or the ones populated with specific groups which are avoided, being the most exposed to risk (minorities, low-income population etc.). In more than one third of the Romanian counties one third of medical specialties are not covered.

The primary care is currently provided by the family doctor, aiming to be an emphasis of the role of primary medical services, as a first filter of problem solving. The access to ambulatory and hospital care (outside the emergencies ones) and the one to subsidized and free drugs is done through family doctor. The Ministry of Health is maintaining only the role of financing and coordinating the national public health programs.

Infant and maternal mortality are relevant indicators of access problems of mothers and newborns at healthcare, of the reduced quality of offered services to them and of low level of informations concerning different methods of disease prevention and maintenance of sanitary hygiene.

As is mentioned in Life Expectancy (2013) report, elaborated by NIS, in 2012, in Romania, the infant mortality rate was 9‰, the precocious neonatal mortality rate (0-6 days) was 3.2‰, the neonatal mortality rate (0-28 days) was 4.8 ‰ and the post-neonatal mortality rate (1-11 months) was 4.2‰.

The evolution of infant deaths per 1000 live births in Romania during the period 2007-2013 is presented in Fig. 1. Among EU members, as is mentioned in (OECD, 2014) report, in 2012, Bulgaria (7.8‰) and Romania (9‰) have the highest infant mortality rate, at opposite pole been situated Slovenia (1.6‰) and Finland (2.4‰), the European average been of 4 deaths per 1000 live births.
2. Methods

Several studies, ((Cristache et al., 2007a) and (Andrei et al., 2009a)), in Romanian health domain are based on statistical data, at national and regional level, provided, mainly, by the National Institute of Statistics. The main statistical methods used in collecting data series corresponding to macroeconomic indicators characterizing the health and social care system in Romania are the exhaustive surveys. In order to analyze the quality of private or public medical services use were also applied statistical surveys (Cristache et al., 2007b).

The principles of elaboration of the system of indicators of the Romanian health system aim to highlight the ensuring of the efficiency and the increase of the degree of applicability and comparability (Danciu and Gruiescu, 2007a). There are a series of studies, (Andrei and al., 2009b, 2009c) where were applied various types of econometric models as simultaneous equations models or panel data models, at regional or national level, in order to highlight the characteristics of the Romanian health system and of public medical services.

In (Albu and Iacob, 2008) is mentioned that “in conformity with World Health Organization, statistical indicators concerning population health and of the health care system are grouped in indicators of mortality and morbidity, but also in indicators characterizing the coverage of population necessities by medical services and in indicators of risk factors”, the last type of indicators calculus method been presented in (Danciu and Gruiescu, 2007b).

For a more complex analysis of the relations and of the interdependence between macroeconomic indicators characterizing the medical and social care system in Romania, elementary methods of analysis are often insufficient. Therefore, are completed by econometric modeling methods (Mitrut and Serban, 2007). Data processing is realized using programs of database administration and analysis (Dobrin and Serban, 2010).

For data sets processing we used statistical chart for the presentation of the certain indicators from health domain; statistical analysis of analyzed indicators; econometric model estimated using ordinary least square method.

In this work we used the following data sets: number of physicians; number of hospitals; number of patients out of hospital (thousands persons); number of beds in hospitals. Statistics are recorded annually for the period 2001-2013. Data series were provided by NIS, Tempo-online. Time Series and were processed in Excel and EViews (Andrei et al., 2008).
3. Results

The evolution of the number of doctors (persons), number of patients out of hospital (thousand persons) and of the number of hospitals in Romania (medical units) during the period 2001-2013 is shown in Fig. 2.

![Fig. 2. The evolution of the number of hospitals, physicians and patients out of hospital in Romania during the period 2001-2013](source: N.I.S. TEMPO - Online. Time Series Retrieved from http://statistici.insse.ro/shop/?lang=ro)

The average absolute growth of the number of hospitals for the period 2001-2013 was about 5 units per year, meaning an average relative growth of 1.009 times and the average annual number of hospitals was equal to 456 hospitals per year. The average absolute growth of the number of physicians for the analyzed period was about 610 physicians per year, meaning an average relative growth of 1.012 times and the average annual number of physicians was equal to 49487 physicians per year. The number of patients out of hospital registered a mean absolute decrease for the period 2001-2013 of 27 thousand patients, meaning a mean relative decrease of 0.99 times and the average annual number of patients out of hospital was equal to 4596 thousand patients.

Trends in the evolution of Romanian health system indicators are completed by an analysis of the dependence and interdependence among the following indicators: number of physicians, number of hospitals, number of patients out of hospital (thousands persons) and number of beds in hospitals for the period 2001-2013.

In order to verify the existence/absence of a relation between the mentioned indicators was used a multiple linear regression model. The number of doctors was considered as dependent variable ($y_i$) the number of patients out of hospital (thousands persons) ($x_1$), the number of hospitals ($x_2$) and the number of beds in hospitals ($x_3$) as influence factors.

The regression analysis covered the following stages: developing the regression model, estimating the model parameters and checking the accuracy of results.

By applying a multiple linear regression model using EViews programme were obtained the following results:

$$
\hat{y}_i = 41088.22 - 2.48 x_1 + 73.76 x_2 - 0.098 x_3; \quad R^2 = 0.913
$$

$$
\hat{y}_i = 18.979 + 26.2 x_1 + 913.0 x_2 + 0.98 x_3; \quad DW = 2.26
$$

$$
\hat{y}_i = 22.4108 - 0.88 x_1 + 34.3 x_2 + 0.34 x_3; \quad s_a = 979.18
$$

The values presented between the parentheses represent $t$ statistics corresponding to the estimated parameters,
\( R^2 \) – the coefficient of determination, \( DW \) represents Durbin –Watson statistics and \( s^2_u \) - standard error of the regression.

By applying the known statistical tests to verify the significance of the model parameters, the significance of the model and of OLS assumptions, we find that the estimation results and the model were statistically significant at the 5 percent level of significance, except the number of patients out of hospital (thousands) which is insignificant. The OLS assumptions are verified for the same level of significance, except the serial correlation hypothesis, tested using Durbin-Watson Statistics, DW, which indicated indecision but can be ignored.

The connection between the variables included in the model is measured by the multiple coefficient of correlation, equal to 0.955. We appreciate that between the variables exists a linear and intense dependence.

The number of patients out of hospital, the number of hospitals and the number of beds in hospitals explain 91.3% of the variation of the number of doctors, the difference of 8.7% representing other factors’ influence.

4. Conclusions

The Romanian health system in Romania is at the end of a prolonged transition from an integrated model, in which most health providers were in public ownership, under the authority of Ministry of Health, to a contractual model, funded predominantly from public sources, where the majority of health care providers, public or private, have a high degree of autonomy and are binding contracts with health insurance houses.

State’ s health system problems in Romania are multiple and occur at every level, from national to county level, in the detriment of the health of the population. The lack of information among the population concerning the necessity of health insurance and of the conditions of access to health services maintains some potential applicants outside the public insurance system. The low education level also determines a non-insured comportment.

The benefits of the private medicine apparition are multiple: it gave rise to a competitive market in the medical field; it imposed a permanently increase of the medical act quality through performance equipment and well-trained professional personnel; it changed the mentality concerning the relation doctor-patient; it led to higher levels of health education of the population; it allowed the creation of new job places etc. Although is supposed that there is “competition” between the two health systems existent in Romania, the private and the state one, certainly, there aren’t contradictory relations, but only complementary ones. Given that in all civilized countries the two health systems coexist and have good cooperation, we hope that in Romania, the medical legislation, in constantly changing, will bring an improvement of the existing regulations and, through the private insurance system, to ensure a competitive market between private and public health providers, a situation from which will firstly benefit the patient.

References


