

## Migration and Health System in Romania

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### Abstract

*The health system is vital for any society, especially for developing societies and economies, such as Romania. Health system represents a barometer for the progress of a state, the quality of medical services and the health status of the population being indicators of the level of development. The purpose of this study is to establish if there is a link between the health system and migration, and for this we analyzed the variables: mortality rate, born dead, number of hospitals, number of doctors and number of emigrants. The analysis was reported for Romania, the year 2017.*

**Key words:** migration, health system, mortality rate, born dead, hospitals, doctors

**J.E.L. classification:** C21, C38, I15, F22, O15

### 1. Introduction

The health system is a vital one for any society, and even more so for developing societies and economies, such as Romania. Health represents a barometer for the progress of a state, the quality of the medical services and the health status of the population being indicators of the level of development, so that the research of the health system becomes a priority area and a real necessity.

Health systems are defined by the financing mode. The health systems used in Europe are the following: Bismarck system, Beveridge national health system, Semasko centralized health insurance system and private health insurance system. In Romania since 1999 the Bismarck type health system operates, but it also has influences from the Semasko and Beveridge models. The characteristic of the structure of this system is represented by the health contribution, both by the employer and by the employee. (Bârliba and Sinițchi, 2008).

The Eurostat 2016 report places Romania on last place regarding the efficiency of the health system and its ability to save lives. In 2013, almost half of the deaths that occurred in the Romanian hospitals could have been avoided given the technological evolution and the current medical knowledge (<https://ec.europa.eu/eurostat>). Out of the 18 million inhabitants of the country, about 8 million pay for social health insurance, which means that the percentage of taxpayers is below 50% and the percentage of those insured is almost 90%.

Given the limited resources existing in the health system, their efficient allocation and use to generate the most sustainable effects should be considered as a public policy priority. The results of the efficient use of the resources in the health system result in a better state of health of the population, the reduction of morbidity, which can generate in the long term an increase of the healthy life. Of these factors, human resources play a decisive role, being the key factor that ensures the functioning of the system.

The volume, as well as the quality of human resources in the health system, have undergone severe changes in recent years, as a result of an exodus of medical personnel abroad, in the context of the increase of the general Romanian migration.

## 2. Literature review

Migration allows people to travel where they are best, both socio-educationally and financially, having implications in many areas, such as: social, demographic, psychological, economic, political, military and even ecological. (Vasilescu and Apostu, 2017).

In Romania, migration has grown since the 1989 revolution, and its trend is constantly increasing. The evolution of migration and its influencing factors is one of the most discussed research topics in the literature. The main causes of migration are: irregular development in the economy, health and education, relaxation of traditional social constraints, rapid population growth, political and economic marginalization, environmental degradation and conflict or war. In Romania this phenomenon was caused by the transition from communism to democracy and the level of economic development (Rotariu, 2009).

Migration has many advantages and disadvantages. The consequences of migration are: the considerable reduction of the population that leads to an economic downturn, the increase of the phenomenon of aging of the population, family problems, problems among the children left in the country, dysfunctions in the labor market, the emigration of the skilled labor force, the wage distortion, the development of the economy, reducing the state budget, especially the public health and pensions. The advantages of migration are: remittances that lead to increased incomes and consumption and to reduce poverty in the short term, reduce unemployment and increase the skills of workers left for work (Roman and Voicu, 2010).

Also, the results of the studies show that people who migrate are predominantly young people capable of work, and the factors that most influence this phenomenon are the economic and social ones. (Apostu, 2018).

## 3. Data and method

The analysis of migration and health system was performed in 2017 for Romania. The data source is represented by the website of the National Institute of Statistics, <http://statistici.insse.ro>. The analyzed variables are: mortality rate, born dead, number of hospitals, number of doctors and number of emigrants.

The number of emigrants represents the total number of emigrants from Romania in 2017.

The mortality rate represents the number of people who died in a year compared to the population as of July 1 in the current statistics and is expressed in the number of deaths per 1000 inhabitants.

The born dead variable represents the number of persons born dead in Romania in 2017.

Doctors represent the number of doctors in Romania in 2017.

Hospitals represent the number of hospitals in Romania in 2017.

The methods used in the analysis are regression analysis and the principal components method.

Principal component analysis (ACP) is a descriptive method of multidimensional analysis that is applied to the study of focused and small numerical variables. ACP is a method of factorial analysis that reduces a complex system of variables correlated with a small number of latent variables (Pintilescu, 2007).

The principle of this method is to extract the smallest number of components to reflect as much as possible of the total information contained in the original data, the components being constructed so that they are not correlated with each other, each of these new variables being a linear combination of original variables. (Giannelloni & Vernet, 2001)

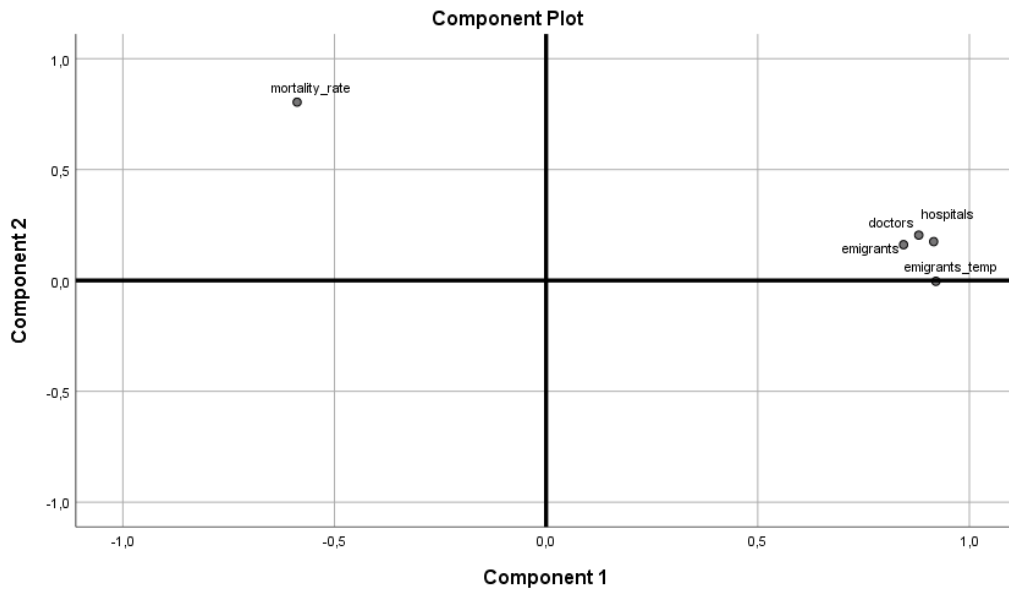
The regression implies the existence of a statistic link on the behavior of some variables (Jaba, 2002). A phenomenon is the result of the action of one or more factors. The linear regression models, its variants and extensions are the most useful and used statistical tools for research (Fox, 1997).

Regression analysis is a statistical method by which we study and measure the bound that exists between two or more variables, as well as discover the relative law according to the links between variables (Jaba, 2002). The multiple regression model describes and evaluates the relationship between a dependent variable and at least two independent variables in order to predict the mean value of the dependent variable, knowing the values of the independent variables.

#### 4. Findings

The graphical representation of the variables registered for the Roamnaian counties for 2017 (Figure 1) emphasizes that the variables number of doctors, number of hospitals, number of emigrants and number of temporary emigrants are located on the first factorial axis, which means there is a direct connection between these variables. On the second factorial axis lies only the variable mortality rate, highlighting an inverse link with the rest of the variables.

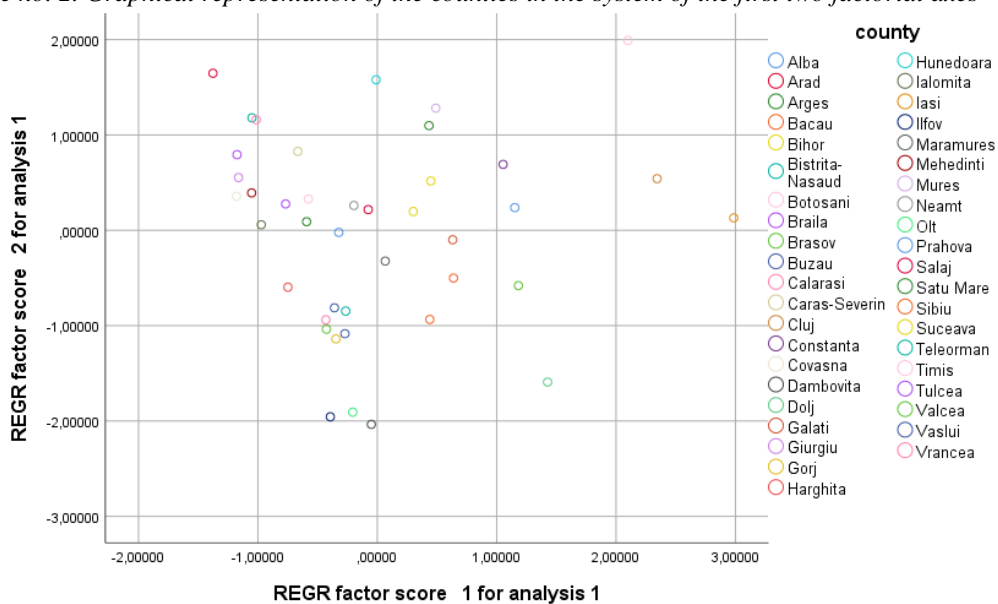
Figure no. 1. Graphical representation of the variables in the system of the first two factorial axes



Source: Own Projection, using SPSS

The graphical representation of the counties in the system of factorial axes, relies that the counties with high mortality rates are: Sălaj, Bistrița Năsăud, Călărași, Hunedoara, Mehedinți and Tulcea. The counties registering big values for number of doctors, number of hospitals, number of emigrants and number of temporary emigrants are: Iasi, Dolj, Prahova and Timiș (Figure 2).

Figure no. 2. Graphical representation of the counties in the system of the first two factorial axes



Source: Own Projection, using SPSS

As in the main component analysis, from the correlation matrix (Table 1) it is observed that between the variables number of emigrants, number of temporary emigrants, number of doctors and number of hospitals there is a direct link, the largest being between the number of temporary emigrants and the number of hospitals. Another strong link is between number of doctors and number of hospitals, followed by the link between number of emigrants and number of temporary emigrants. Between these four variables and the mortality rate the link is inverse, the highest in intensity being between the mortality rate and the number of temporary emigrants. Therefore, when the number of hospitals increases, the number of doctors increases, the mortality rate decreases, but also the number of emigrants, both permanent and temporary, increases.

Because the number of permanent emigrants is smaller than the number of temporary emigrants and permanent emigrants can also include temporary emigrants, we performed a regression analysis in section, having as dependent variable the number of temporary emigrants and as independent variables: number of doctors, number of doctors hospitals, number of born dead and mortality rate, in Romanian counties. The model is valid and the determination ratio is 0.96, meaning 96% of the variation in the number of emigrants is due to the variation in the number of dead babies, the mortality rate, the number of hospitals and the number of doctors.

Table no. 1 Correlation Matrix

		<b>hospitals</b>	<b>doctors</b>	<b>emigrants</b>	<b>emigrants_temp</b>	<b>mortality_rate</b>
Correlation	hospitals	1,000	,818	,686	,842	-,397
	doctors	,818	1,000	,692	,720	-,378
	emigrants	,686	,692	1,000	,729	-,373
	emigrants_temp	,842	,720	,729	1,000	-,512
	mortality_rate	-,397	-,378	-,373	-,512	1,000
Sig. (1-tailed)	hospitals		,000	,000	,000	,005
	doctors	,000		,000	,000	,007
	emigrants	,000	,000		,000	,008
	emigrants_temp	,000	,000	,000		,000
	mortality_rate	,005	,007	,008	,000	

Source: Own Projection, using SPSS

The results (Table 2) show that the variables: mortality rate, number of hospitals and number of borndead are statistically significant, but the number of doctors is not statistically significant. When the number of hospitals increases by one unit, the number of emigrants increases by 177.41 persons, when the number of born dead increases by one unit, the number of emigrants increases by 139.34, and when the mortality rate increases by one percentage, the number of emigrants decreases by 677.08 persons. When the number of born dead increases, it is normal for the number of emigrants to increase as they seek better conditions from all points of view. In contrast, when the number of hospitals increases, we would expect the number of emigrants to decrease, but in our analysis the number of emigrants increases. One reason for this increase may be the fact that the emigrants do not trust the health system in Romania and its efficiency. The same situation is encountered in the case of the variable mortality rate, when it increases, we would expect the number of emigrants to increase, but in our analysis it also increases, an explanation being that those who emigrate do not trust the health system in Romania, and the decision to emigrate is not significantly influenced by the mortality rate, but by the number of hospitals and economic factors.

Table no. 2 Regression analysis

	<b>Temporar Emigrants 2017</b>			
Number of Observations	42			
Mean dependent var	5766.5	Number of Variables	5	
S.D. dependent var	3156.26	Degrees of Freedom	37	
R-squared	0.964499	F-statistic	251.306	
Adjusted R-squared	0.960661	Prob(F-statistic)	2.84854e-026	
Sum squared residual	1.48537e+007	Log likelihood	-327.893	
Sigma-square	401453	Akaike info criterion	665.787	
S.E. of regression	633.603	Schwarz criterion	674.475	
Sigma-square ML	353661			
S.E of regression ML	594.694			
Variable	Coefficient	Std.Error	t-Statistic	Probability
CONSTANT	4147.76	352.62	11.7627	0.00000
Hospitals 2017	177.413	43.2686	4.10027	0.00022
Doctors 2017	0.368347	0.222619	1.65461	0.10646
Mortality rate	-677.084	89.4112	-7.5727	0.00000
Born dead 2017	139.337	18.4943	7.53404	0.00000

Source: Own Projection, using GeoDa

## 5. Conclusions

The state of the health system of a country indicates its level of development. Migration means that people are leaving where they are better, which also implies a good health system.

A good health system attracts migrants to the respective country, they represent the labor force that contributes to the health system fund. A large fund of the health system means funds for investing in the health system (equipment, doctors, good hospital conditions, medicines). The state of a health system can be evaluated by analyzing the number of hospitals, the number of doctors, the mortality rate.

The results of the analysis of the health system in relation to migration in Romania in 2017 showed that between number of doctors, number of hospitals, number of emigrants and number of temporary migrants there is a direct link, instead between the variable number of doctors, number of hospitals, number of emigrants and number of temporary migrants and mortality rate the link is inverse.

The counties with the highest mortality rates in Romania are: Sălaj, Bistrița Năsăud, Călărași, Hunedoara, Mehedinți and Tulcea, and the counties with large numbers of doctors, hospitals and emigrants are: Iasi, Dolj, Prahova and Timiș.

The regression analysis concluded that the number of emigrants is significantly influenced by the mortality rate, the number of hospitals and the number of born dead. In contrast, the number of doctors in Romania for 2017 does not significantly influence the number of emigrants. One reason for this increase may be the fact that the emigrants do not trust the health system in Romania and its efficiency. The decision to emigrate is significantly influenced by the number of hospitals and economic factors.

Subsequent developments in the study should enlarge the sample, and should also include social and economic factors. Moreover, depending on the possibilities of accessing the necessary specific data, the study can also be applied for Europe regions.

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