

CONTRIBUTE FACTORS TO THE ROMANIAN DEMOGRAPHIC BODY

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Abstract: This article includes a statistical analysis of the main Romanian demographic phenomena. The numerous red flags drawn by the scientists, reverberated in the media, refers to the demographic decline, accentuated by the visible populations aging trend. The main concern of many working age individuals are due to the most probable consequences: future challenges of the social security pensions system resulted out of the reversal age pyramid. The aging population will become more numerous than the working age population, those who pay social insurance will be less numerous than those entitled to receive pensions.

This analysis is destined for a statistical analysis of the relationship between the demographic phenomena, in an attempt to discover the specific relationships. This paper's conclusions may be relevant for the development of a coherent demographic policy based on measurable goals.

Keywords: demography, population, correlations, demographic phenomenon, demographic process.

1. A POPULATION'S RESEARCH OBJECTIVES

The scientific knowledge and the theorising ability of the researchers have in the most cases, applicability in various areas of the social and the economic life. In the context of this article we try to subordinate to the social needs, a demographic phenomenon analysis that is designed to concern those assigned to develop and implement public policies regarding the Romanian demographic balance.

The starting point of such a process originates in the declared objectives of the demography¹: the size knowledge, population's structure and distribution, description of the total or regional population's evolution, identifying the links

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¹ Rajendra Sharma, *Demography and Population Problems*, New Dehli, Atlantic Publishers and Distributors, 2007, p. 9.

between the population trends and a certain indicator and the accurate estimations of the population's trend and their consequences.

The finality of this research is useful in various fields of social life, in the development of some public policies or even in the development of some feasibility studies or marketing²: health investment planning, food production and supply planning, workforce planning, education's infrastructure planning, housing planning and elaboration of some public migration control policy.

In the present research we focus on the main phenomena that directly influence the demographic body: mortality and natality. The purpose of this research is to detect the factors that determine the current structure of the Romanian demographic body and predictions of the future to identify the main elements that can stand a base on the balance of the demographic policy.

2. NATALITY AND MORTALITY

Natality refers to the number of the newborns in a society in a certain time. This phenomenon occurs under the influence of some complex factors that can be grouped in two broad categories: on the one hand we have the size population, related to the reproductive biological capacity, as the weight of the female population at childbearing age. The age period of childbearing adopted in scientific research is placed on the range of 15-49 years in the female population. A second category of factors that influence the natality is more complex, such as the cultural or socio-economic framework. In the second category we have to remember another demographic indicator: fecundity, representing "a woman's physiological ability to procreate"³. Thus, fertility is a consequence of fecundity, subjected to numerous factors.

From a scientific perspective we see that natality occurs depending on the share of childbearing women age and the economic context, socially and culturally existing in society.

Mortality is the mass of deaths in a society or a geographic region. The scientific literature reveals the specific nature of this phenomenon: all the demographic phenomena occur under the influence of the factors which determine their associates, while death is the only phenomenon that it relates directly to each individuals. For example, the emerge of a new born does not concern him, but his parents⁴. All the other demographic phenomena, such as marriage, migration, divorce are influenced by a multitude of factors that place them under the probability theory.

² *Ibidem*, pp. 9-10.

³ *Ibidem*, p. 20.

⁴ Traian Rotariu, *Demografie și sociologia populației, fenomene demografice*, Iași, Polirom Publishing, 2003, p. 53.

Mortality's characteristics are as follows⁵: every individual is at the risk of death, is an unavoidable phenomenon that will surely occur in the life of every individual, it concerns only one person, it is unrepeatably and the least influenced by the other demographic phenomena.

Considering the specificity of mortality we note that in addition to the limited capacity of the biological being existence there are clearer factors that determine it⁶: hunger and food shortages, epidemics, wars and poor sanitary conditions.

Mortality becomes the demographic phenomenon that can only be delayed but not avoided. The actual societies evolution and the medical science have enabled a permanent increasing lifespan by limiting the influencing mortality factors.

Statistica, surveys conducted over time reveal some regularities people's lifespan depending on some certain factors⁷: the residence, where we find that mortality is lower in urban areas; profession, explained by the fact that a certain profession affects the health of those who practice them; region, due to the differences in the individuals lifespan; parent education, observing that in the educated parents household the children are much healthier and have a longer lifespan than those from families with low levels of education; the marital status, married people tend to have a longer life than the unmarried; the socio-economic status; finding that people with a higher socioeconomic status had a higher life expectancy than others. In some societies it was found that religion has an influence, statistically proven, over its life.

3. STATISTICAL ANALYSIS OF THE MAIN DEMOGRAPHIC INDICATORS

The statistical method allows the identification of some trends and the relationships between the different demographic processes. Statistical data processing permit the interpretation of the raw data according to the specific objectives. Also, the statistical monitoring has the merit to signal early thenegative consequences of the status quo.

The adopted measurement efficiency can be measured by comparing the available data at one time with those estimated to be produced when developing a public policy. Using the statistical measurement methods can bring corrections to the insufficient trends oriented to the undesirable objectives or to those that have negative consequences over the society.

In the past period from the Romanian Revolution from 1989, Romania's population decreased permanently, although at the regions level, counties or towns we can observe fluctuations in the population numbers. Between 1990-2012 (Tempo-Online Database, data processing) the total population has decreased by 7.99%.

⁵ *Ibidem*, p. 54.

⁶ Rajendra Sharma, *op. cit.*, p. 127.

⁷ *Ibidem*, pp. 135-139.

The same trend is reflected at a regional level, where we see in all the regions that the population registered declines between 2.15% in the North-East region and 13.23% in the West region.

Table 1

Total population's structure

Region	Population in 1990	Population in 2012	Population's evolution	Annual rate
Romania	23,211,395	21,355,849	-7.99%	-0.35%
North-West	2,983,614	2,712,188	-9.10%	-0.40%
Center	2,860,490	2,519,787	-11.91%	-0.52%
North-East	3,781,932	3,700,695	-2.15%	-0.09%
South-East	2,980,559	2,791,190	-6.35%	-0.28%
South-Muntenia	3,619,796	3,239,247	-10.51%	-0.46%
Bucharest-Ilfov	2,325,037	2,264,865	-2.59%	-0.11%
South-West Oltenia	2,461,463	2,220,224	-9.80%	-0.43%
West	2,198,504	1,907,653	-13.23%	-0.58%

Source: National Statistical Institute, *Tempo-Online Database, 2014, data processing.*

The trends structure revealed by this study highlights the existence of some regional or local factors that influence them. For understanding the demographic decline some analysis are needed on the impact that the demographic phenomena have on the population volume.

The most important data come from statistical analysis of the total volume population, mortality and natality. Through these changes we will sense the impact of the migratory movement of the population through the difference between the evolution of the natural growth and the total population.

Table 2

The demographic body evolution based on the main indicators

Region	Population in 1990	Population 2012	Annual evolution in 1990-2012	Mortality annual evolution	Natality annual evolution	Natural growth average
North-West	2,983,614	2,712,188	-0.40%	-0.37%	-1.61%	-1.29%
Center	2,860,490	2,519,787	-0.52%	0.01%	-1.36%	-0.46%
North-East	3,781,932	3,700,695	-0.09%	1.36%	-1.72%	1.71%
South-East	2,980,559	2,791,190	-0.28%	1.03%	-1.77%	-0.97%
South Muntenia	3,619,796	3,239,247	-0.46%	0.24%	-1.71%	-2.87%
Bucharest Ilfov*	2,307,700	2,264,865	-0.11%	0.44%	-0.23%	-2.44%
South-West	2,461,463	2,220,224	-0.43%	-0.13%	-1.99%	-2.99%
West	2,461,463	2,220,224	-0.58%	-0.81%	-1.58%	-2.99%

* data starting with 1997

Source: National Statistical Institute, *Tempo-Online Database, 2014, data processing*

4. INFLUENCE DESCRIPTIONS BASED ON THE STATISTICAL CORRELATIONS

Romania's total population trend is significantly influenced by other demographic phenomena, such as natality or mortality. This is the result of a specific way to configure these trends, often dependent on some certain changes occurred in an regional or an county level.

The evolution of Romania's total population is significantly correlated with the developing regions population, but in varying degrees, resulting in three groups. The first group consists in the North – West, South – East and West, whose trends correlate mostly with the national trend, followed by a second cluster consisting in a group with a significant correlation but slightly lower than in the first group: the Center Region, North-East and South. The last group consists of Bucharest-Ilfov and the South-West regions that have weak correlations with the national trends. Please note that we can not conclude that the two regions are similar in the demographic phenomena trend as the population trends between the two regions does not correlate. This means the existence of some particular demographic features of the two regions.

Mortality is correlated in all the regions by contributing to the national trend in comparable proportions. Analysed separately from other demographic phenomena we find that we can speak of a similar pattern in most developing regions and the lack of correlation with the evolution of the other demographic phenomena.

The only exception is the South-West Oltenia where we notice a link between the mortality and the total population. The bivariate correlation indicates a weak intensity of 0.453 at a 0.05 significance. The positive direction of this correlation indicates a direct influence on the overall mortality's population. Given the total population's trend likeness of this region with the Bucharest-Ilfov, but the relationship does not exist, we find the first difference between the two regions. This direct relationship indicates a growth tendency in the elderly population, followed logically by an increase of the mortality, revealing that a significant proportion of young people are temporarily migrating for work in other areas of the country or abroad, perhaps returning when they're approaching retirement.

Deepening the analysis through the factorial analysis indicates that there are five major factors, with a composite internal structure, which determinate a significant change in the population (95.89%). In order, they are: mortality which explains in a proportion of 26.15% the intern population dynamics; emigration, which explains in a proportion of 21.67% the population dynamics; marriage, explains the demographic phenomena in a proportion of 18.75%; natality which explains the variation in a proportion of 16.05%; and the population structure, which influence the demographic dynamics in a proportion of 13.27%.

The statistics show a major influence of the first two factors, encompassing 47.82% of the total explanation of the population dynamics. Both phenomena,

mortality and emigration have a negative influence on the demographic body volume. Their influence on the overall development shows that the demographic body inhibiting phenomena are predominant in the population's dynamics.

The main phenomenon that helps to increase the population – natality – has a reduced contribution of just 16.05% on the demographic dynamics. The phenomenon which theoretically favors birth – marriage – is contributing with 18.75%, but this contribution is indirect, there are many factors determinating this phenomenon.

These phenomena are found and are influenced by the Romanian's population structure. All the elements that acts on the demographic body are dependent by this indicator, which, in his turn, contribute to an extent of 13.27%.

By comparing the two types of analysis, we observe that although there are no significant correlations between the demographic phenomena, some of them contribute directly to the demographic body size. For example, mortality is not just due to the aging process but also to the natural causes. This is due to the living conditions, living standards, health system, working conditions, etc. In emigration's case, prevailing are the economic conditions, freedom of movement, host countries opportunities, etc. The natality is influenced by the population's social behavior, pro-natalist or anti-natalist policy, family assistance, etc. How this phenomena of different nature interact is complex and can be difficult to measure. But the understanding of these relationships and how they interconnect may create some necessary fundamentals of some public policy to mantain the demographic body balanced.

5. THE DESIGN SIZE

In an attempt to highlight the future possibilities we conducted a statistical experiment by analyzing the current demographic trends in projections for ten years. The limits of this experiment are generated by the linear nature of the data analyzed. Over the years there may be events that cand change the course and may determine other correlations. For understanding the possible implications of the present situation we try this method. After presenting the data there can be outlined some general directions for action.

In order to define more percisely the current demographic trends consequences on long term, we continued the projection to 2020. The items sought are those relating to take place between the demographic phenomena and factors that determine the body dynamics. These relationships are important to understand the departure points in developing a strategy for the demographic balance and limit some of the negative consequences of the demographic phenomena.

The projection of the demographic evolution for 2020, highlights some significant issues. The bivariate correlations comparison shows that between the country's population and the regional population will produce mild changes that in long-term will approach the recorded correlation values. Thus, the regions correlated very strong with the national trend was reduced to two, increasing to four regions from the second category. The two regions (Bucharest-Ilfov and South-West) which moderately correlates with the national trend have taken different directions: the first region correlation intensity is decreasing, while the second region trend correlation intensity is growing.

Mortality continues to strongly correlate in all regions. The only coincidences that can attain future consistency exists in how the insignificant correlations tend to become inverse correlations.

The factorial analysis highlights five determinants factors of the future evolution of the demographic body: mortality (explaining the dynamics in a percentage of 29.11%), emigration (explaining the dynamics on a rate of 21.16%), marriage (explaining in a proportion of 18.59%), population structure (explaining in a proportion of 14.91%) and natality (which explains the demographic dynamics modification in a proportion of 12.39%). The total of this dynamic explains the population dynamic in a proportion of 96.15%.

Table 3

The future influence of the demographic phenomena on the Romanian population

Phenomenon	Year	Proportion in which it explains the demographic dynamics		
		2010	2015	2020
Mortality		26,15	25,88	29,11
Emigration		21,67	18,90	21,16
Marriage		18,75	16,57	18,59
Natality		16,05	16,09	12,38
Population structure		13,27	13,51	14,91
Divorce		-	5,40	-
Total		95,89	96,35	96,15

Source: National Statistical Institute, *Tempo-Online Database, 2014, data processing*

It appears that the current demographic structure will significantly increase mortality's influence on the demographic dynamics. Also, emigration will consistently influence the demographic body volume, with negative consequences on the age groups balance. Marriage will return to the share it currently hold, and nuptiality, the phenomenon favored by marriage will decrease consistently between the phenomena influencing the demographic body. The population structure will have a greater influence on the population dynamics.

CONCLUSIONS

By this projection we find that the main demographic phenomenon that influence the actual demographic body – mortality – can be understood from many perspectives: on the one hand we talk about a phenomenon with an increasing influence, due to some factors connected with its evolution, such as life expectancy, on the other hand we see a trend of population aging, the consequences of which will be reflected in the increased mortality. Emigration is contributing to this trend through the young people that are leaving the borders. Following these arguments we call in attention the dimension of this phenomenon, compared to those that maintain the demographic balance such as natality. The natural growth tilt the balance significantly toward mortality, showing a clear tendency to reduce the demographic's natural body.

Mortality is an imminent natural phenomenon, one that can not be influenced by a certain public policy. In developed countries it appear later for a large number of citizens, while the less developed countries it occurs in a shorter period of time. In terms of life expectancy, it's the indicator widely used for life quality, it can create a world map. Life expectancy is very low in many countries on the African continent and very high in Europe, America and Japan. The reasons for which these phenomena have specific causes on every society, especially on cultural and social nature. However, in poorer countries with lower life expectancy, the natality in higher balancing the internal structure of the demographic body. In Romania's case we ask about the long-term consequences generated by a demographic decline due to a low life expectancy specific to the developing or poor countries, a low natality specific to the developed countries, all amid a significant migrations and a difficult social-economic context.

In the absence of a positive natality able to determine a natural balance equal with 0 or greater, we will witness in time, mortality's increasing influence in the population's volume dynamics. In less developed countries, particularly Arab countries, there is a high natality, wich register higher values than anywhere in the world, but amid a low life expectancy we witness a moderate population's growth. Maintaining a high natality amid a prolonged life expectancy determinates an accelerate demographic body growth.

The aplicability of such analyzes is found in the government planning effort: the amount of food, necessary financial mass, number of schools and hospitals, the number of doctors needed, the study of the labor market, the needs of the human communities, etc. The systematic analysis of the demographic phenomena is the way to evaluate the current needs and the future needs.

The guidelines of a demographic's body public policy balance can be drawn based on the determinants hierarchy. For example, in 2010 the mortality influenced

the demographic body in a proportion of 26.15% , but in current configuration we can wait at a influence of 29.11% in 2020, we will assist at an aggravation of this influence. Increasing the life expectancy becomes one of the objectives of a demographic strategy. Investments in the social services system, particularly the elders infrastructure, is a long term solution to limit the rising influence of mortality. The health care becomes a major role in such a strategy. The high price of medicine and medical services system removes many people and the consequences are those of an increasing trend of mortality.

Emigration is a factor almost entirely determined by the economic size. The rising poverty and the lack of jobs are the constituent elements of this factor. We believe that by inspiring solutions to slow emigration, and even stabilize it, we can hope to remain in the country a large number of young people of working age. Individual strategy of migrants is due to normal life goals for young people: ensuring a minimum standard of living, facilities to obtain a job or to obtain a low-interest loans for starting a business or buying a home. The current standard of living and high costs of living, unreported to the wage level will be generating permanent emigration. Identifying and developing solutions and regulations aimed to block the speculative actions that decrease the life quality (food prices, utilities or even the the recent discriminatory growth of the cars insurance owned by young people) can contribute in some way to reducing the emigration.

The marriage emergence third in the hierarchy of the factors influencing the demographic body indicating not just a factor related to the demographic body, but that the family as the fundamental social unit is affected by the social-economic conditions. The decreasing number of marriages can not be considered just an effect of the demographic decline. The decline of marriage has profound social and economic foundation. Public policy support for young families are ineffective, even discouraging. Although the influence on the demographic body is indirect because natality is influenced almost entirely by marriage, this analysis shows that the phenomenon with direct influenced on the total population – natality – is dependent, in Romania's case by the number of family founded. Thus, any pro-natalist measures should include a number of provisions to support the family and the establishment of the new families. In this sense we believe that the only benefit that addresses to the newborns are not sufficient to influence natality. The current value is different from the traditional. Firstly the growth of the educational level and the need to establish a career determinates a delay in the time the young people enter into marriage.

Natality occupies fourth place in the hierarchy of factors influencing the country's total population. Medical services addressed to young children are insufficient, statistics indicating a very high infant mortality. The risk of poverty is high for many Romanians, which makes the number of children in a middle class

family limited on an average of one or two children. Enhanced protection for young mothers and children can be useful in developing higher birth rates.

The last factor that influences the demographic body volume is the population's structure, identified by the age group shares. Negative trends of the younger age groups and the positive trend of the older age population have an undesirable effect on the population and the consequences will have effects becoming more visible on the life quality.

Finally, we consider that the public policies necessary for the recovery of the demographic body imply an conjugation effort of several elements to achieve visible results, taking into account the time required for the appearance of the first visible effects.