

EVOLUTIONS AND PARTICULARITIES OF MORTALITY INDICATORS IN ROMANIA AND COMPARISON WITH THE EUROPEAN UNION IN THE LAST DECADE

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Abstract

The evolution of the number and structure of any population is directly influenced by the mortality phenomenon. The paper aims to highlight the evolution and particularities of mortality in Romania during 2007-2016 as well as a comparative analysis with the level of the European Union.

The statistical data analyzed highlight some important aspects and particularities. Firstly, must be mentioned the still high level and a slight increase of the crude death rate registered in Romania during the analyzed period, above the level recorded for the EU. Secondly, there are substantial differences regarding the rate of mortality by sex and especially by residence areas.

The paper also analyzes the evolution of an important indicator of the level of social development, determined on the basis of the life table, namely the life expectancy at birth. The indicator is largely influenced by the mortality rates and age structure of the population. Even though during 2007-2016 the level of this indicator registered a slight increase in Romania, yet it is well below the level of the European Union.

Keywords: mortality, life expectancy at birth, crude death rate, specific mortality rates

Introduction

Mortality is a demographic phenomenon that refers to the frequency of deaths in a given population and for a limited time. Unlike fertility, mortality is the negative component of the natural change of the population. Mortality determines the numerical increase or decrease of the population as well as its structure by age groups and influences the life expectancy of the population. Also, mortality is the most sensitive indicator influenced of socio-economic and biological factors (the environment, lifestyle), as well as health services [1].

Under the influence of the factors mentioned above, mortality in Romania has experienced different evolutions in the last 7-8 decades. Thus, before and immediately after the Second World War in Romania there was a crude death rate of about 22.0 ‰. Improvement of health care and access of the population to sanitary services led to a sudden drop of the crude death rate from 22.0 ‰ to 10.0 ‰ in the period 1947-1959. After

1960, the crude death rate continued downward, ranging from 8.1 ‰ to 9.2 ‰, slightly increasing in the 1980s to 10.5 ‰ [2]. As a global phenomenon, the decline of the mortality has been determinate by factors such as: improving nutrition, increasing accessibility to public health services, urbanization, better medicines, etc. [3].

Since 1990, the crude death rates have returned to the values recorded in 1953-1954 (11.6 - 11.5 deaths per 1000 persons), then increased gradually, having many fluctuations and having two peaks in 1996-1997 and 2002-2003.

Although the crude death rates have stabilized around 12 deaths per 1000 inhabitants between 2010 and 2016, Romania is among the European countries with a high crude death rate.

The evolution of the mortality in Romania, during 2007-2016

Based on the statistical data taken from the National Institute of Statistics and EUROSTAT, we will make a brief analysis of the evolution of mortality in Romania during 2007-2016, using three demographic indicators: crude death rate, mortality rate by sex and mortality rate by area. The crude death rate is an indicator of maximum generality that measures the intensity or frequency of deaths within a population or subpopulation; is determined by reporting the number of deaths from a period to the average number of the resident population (permanent or usual) in that period and is expressed per 1000 persons [4].

The mortality rate by sex is based on the reported deaths of male and female, over a certain period of time, of the average male and female population (expressed per 1000 persons). Similarly, the mortality rate by area implies the reporting of deaths among urban and rural population over a period of time to the average population of urban and rural area (also expressed per 1000 persons).

For the period 2007-2016, the number of deaths and the crude death rate in Romania, presented in Table 1, highlights the slight increase trend. Thus, the crude death rate in Romania increases from 11.2 ‰ in 2007 to 11.6 ‰ in 2016.

During 2007-2016, the crude death rate experienced small oscillations from one year to the other, the highest level being recorded in 2015, respectively 11.8 ‰.

The evolution of the number of death and crude death rate, in Romania,
during 2007 – 2016

Table 1

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Number of deaths (thousand)	252.0	253.2	257.2	259.7	251.4	255.5	250.5	254.8	261.7	257.2
Crude death rate* (‰)	11,2	11,2	11,4	11,5	11,2	11,4	11,2	11,5	11,8	11,6

Data sources: Information from Data base TEMPO-on line, NIS Bucharest [5].

*Rates base on permanent resident population

This evolution of the crude death rate was largely determined by the dynamics of the number of deaths, which increased from 252.0 thousand in 2007 to 257.2 thousand in 2016 (+ 2.1%). Thus, we can see not only a rather high level of the crude death rate in Romania (over 11 ‰) but also a growth trend. The dynamics of the crude death rate is influenced by the variation of two factors: specific mortality rate by sex and structure of the population by sex [6]. Regarding the evolution of the mortality rate by sex, we find that throughout the analyzed period the mortality rate for male was higher compared to that recorded for female (Table 2).

The evolution of the mortality rate by sex, in Romania, during 2007 – 2016 (‰)

Table 2

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total	11,2	11,2	11,4	11,5	11,2	11,4	11,2	11,5	11,8	11,6
Male	12,1	12,3	12,5	12,6	12,1	12,2	12	12,3	12,5	12,4
Female	10,3	10,2	10,4	10,6	10,4	10,6	10,4	10,7	11,0	10,8

Data sources: Information from Data base TEMPO-on line, NIS Bucharest, [5].

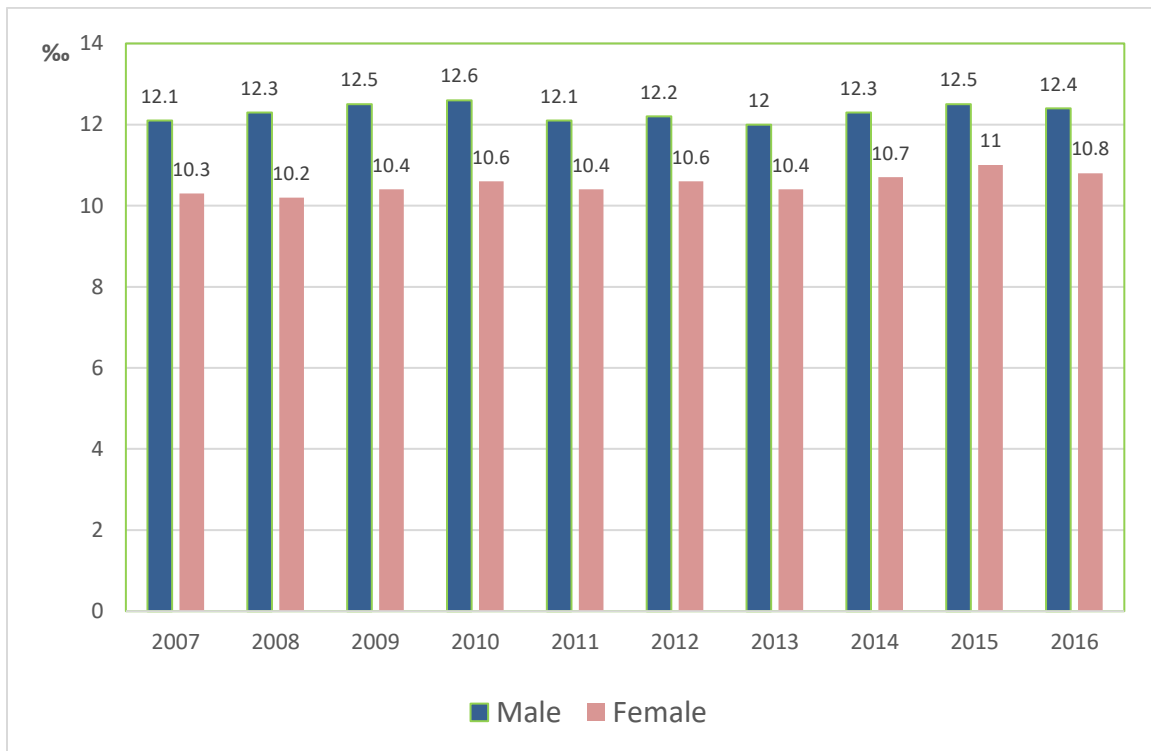
The data from Table 2 as well as from Figure 1 highlight the existence of the phenomenon of male supramortality during the whole period 2007-2016. The differences between the male mortality rate and the female mortality rate are between 1.5 ‰ in 2015 and 2.1 ‰ in 2008.

Mortality in males is primarily due to genetic explanations, the chances of survival of the women being higher at all ages. Secondly, behavioral factors should be mentioned, men

generally having a risky life (participation in armed conflicts, accidents, and alcohol consumption), more difficult jobs, etc.

The evolution of the mortality rate by sex, in Romania, during 2007 – 2016 (‰)

Figure 1



Data sources: Information from Data base TEMPO-on line, NIS Bucharest, [5].

Greater differences exist between mortality rate in urban and rural areas, both as level and as a direction of evolution.

The evolution on the mortality rate by area, in Romania, during 2007 – 2016

Table 3

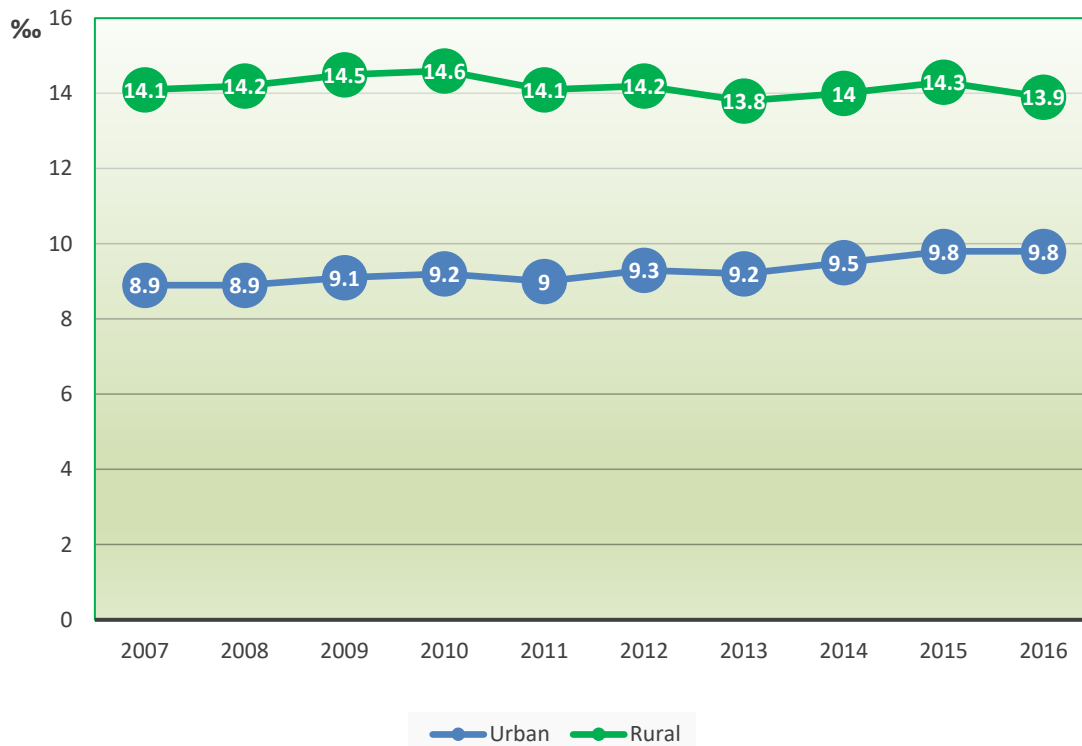
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total	11,2	11,2	11,4	11,5	11,2	11,4	11,2	11,5	11,8	11,6
Urban	8,9	8,9	9,1	9,2	9,0	9,3	9,2	9,5	9,8	9,8
Rural	14,1	14,2	14,5	14,6	14,1	14,2	13,8	14,0	14,3	13,9

Data sources: Information from Data base TEMPO-on line, NIS Bucharest, [5].

It can be seen from the data presented in Table 3 and Figure 2, that the mortality rate in the rural area substantially exceeds the rural mortality rate during the whole 2007-2016 period, the biggest difference (+ 4,6 ‰) being recorded in 2013. We also note that while the urban mortality rate registered a slight downward trend over the period under review, the mortality rate in the rural area increased from 8.9 ‰ in 2007 to 9.8 ‰ in 2016.

The evolution of the mortality rate by area, in Romania, during 2007 – 2016 (‰)

Figure 2



Data sources: Information from Data base TEMPO-on line, NIS Bucharest, [5].

The higher level of mortality in rural areas is explained by a different aging of the population, higher in this case, but also due to the lower accessibility of health care [7].

The high level of general mortality in Romania also results from the comparison with the average level recorded in the European Union and other member countries.

During 2007-2016, the crude death rate in Romania, as compared to the one recorded at the EU28 level, evolved according to the data in Table 4.

The evolution of the crude death rate* in Romania and EU28, during 2007 – 2016 (‰)

Table 4

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
EU28	9.7	9.8	9.8	9.7	9.7	9.9	9.9	9.7	10.2	10.0
Romania	12.1	12.3	12.6	12.8	12.5	12.7	12.4	12.8	13.2	13.1

Data sources: Based on the information retrieved on May 27, 2018, from EUROSTAT, [8].

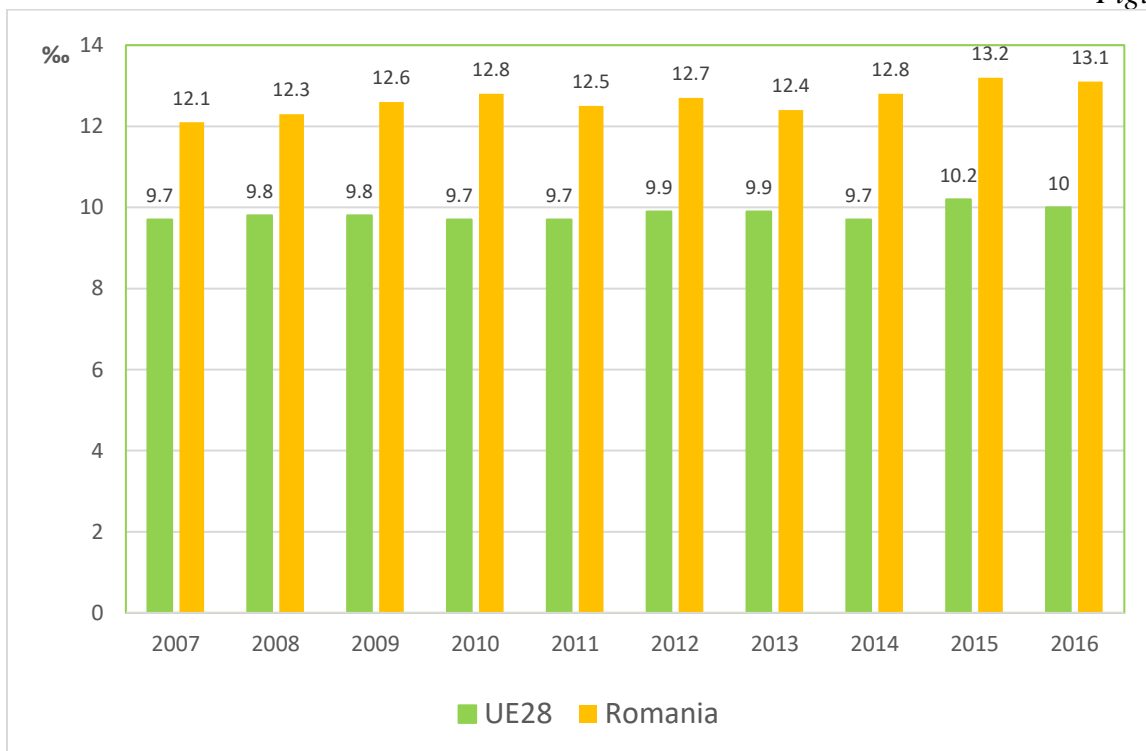
*Rates based on usual resident population

The data from Table 4 as well as in Figure 3 highlight a process of increasing of the mortality rate for both Romania (more pronounced) and the EU28.

Secondly, the crude death rate is much higher for Romania than for the EU27.

The evolution of crude death rate in Romania and EU 28, during 2007 - 2016 (‰)

Figure 3



Data sources: Based on the information retrieved on May 27, 2018, from EUROSTAT, [8].

The lower level of economic and social development, more difficult accessibility to medical services, higher levels of pollution and other factors have affected this unfavorable situation of Romania compared to the EU in terms of mortality rates.

Life expectancy at birth – an important indicator of mortality

Life expectancy at birth or average life duration is an important demographic indicator that expresses the average number of years that a person has to live if they live the rest of their lives under the conditions of age-related mortality from the reference period.

The level of the life expectancy at birth is the result of a set of economic, social, health and cultural factors that, directly or indirectly, with a greater or lesser intensity, act on mortality and thus constitute an excellent indicator of the degree of development reached by a population.

In the case of Romania, life expectancy at birth registered significant changes over the last hundred years.

Life expectancy at birth in Romania, was only 36.4 years old at the beginning of the 20th century, reflecting particularly the very high level of mortality expressed by the crude death rate (over 26 ‰). Analyzed in the European context, this level of life expectancy at birth indicates a gap of 10-15 years, compared to the more developed countries at that time [2].

In the following period there was a slight increase in life expectancy, reaching a life expectancy of 42.0 years, around the World War II (1930-1932), according to the mortality table developed for that period.

After World War II, raising the standard of living, wider accessibility of health care of the population, preventive health care programs and general increasing of the level of population education led to a rapid decline in mortality.

In only ten years (1946-1955) the crude death rate went from 19 ‰ to less than 10 ‰, which led to an accelerated increase of the life expectancy, which reached 63.2 years in 1956.

And after 1956, life expectancy in Romania, continued to grow but with a lower intensity, reaching 67.1 years between 1974 and 1975 [2], and 69.8 years during 1989 -1991.

The changes in the economic and social development of Romania after 1990 with the change of the political regime influenced favorably the evolution of the life expectancy that reached in 2006 at a level of 72.2 years.

Between 2007 and 2016, the life expectancy in Romania and the other EU Member States evolved according to Table 5.

The evolution of the life expectancy at birth in Romania and the EU28 member states,
during 2007 – 2016 (years)

Table 5

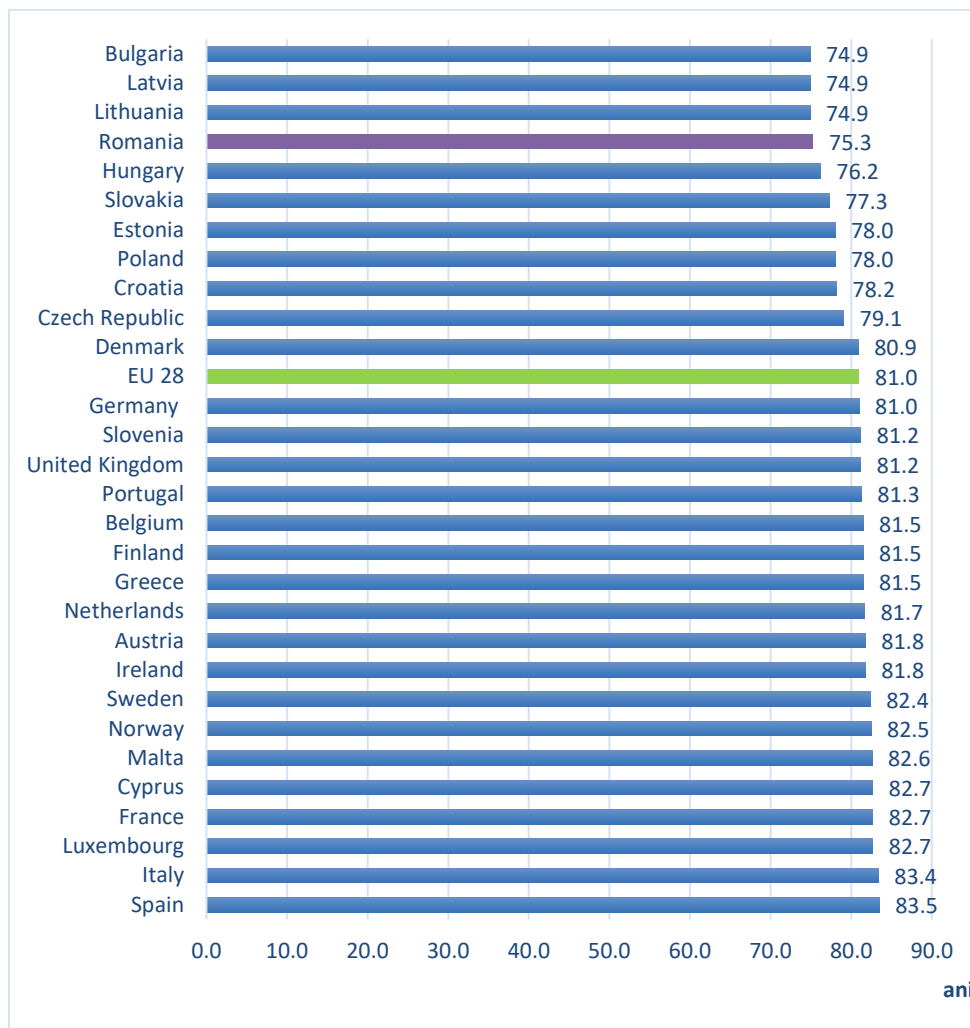
GEO/TIME	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
European Union 28	79.1	79.4	79.6	79.9	80.2	80.3	80.5	80.9	80.6	81.0
Austria	80.3	80.6	80.5	80.7	81.1	81.1	81.3	81.6	81.3	81.8
Belgium	79.9	79.8	80.2	80.3	80.7	80.5	80.7	81.4	81.1	81.5
Bulgaria	73.0	73.3	73.7	73.8	74.2	74.4	74.9	74.5	74.7	74.9
Croatia	75.8	76.0	76.3	76.7	77.2	77.3	77.8	77.9	77.5	78.2
Cyprus	79.8	80.6	81.0	81.5	81.2	81.1	82.5	82.3	81.8	82.7
Czech Republic	77.0	77.3	77.4	77.7	78.0	78.1	78.3	78.9	78.7	79.1
Denmark	78.4	78.8	79.0	79.3	79.9	80.2	80.4	80.7	80.8	80.9
Estonia	73.2	74.4	75.3	76.0	76.6	76.7	77.5	77.4	78.0	78.0
Finland	79.6	79.9	80.1	80.2	80.6	80.7	81.1	81.3	81.6	81.5
France	81.3	81.4	81.5	81.8	82.3	82.1	82.4	82.8	82.4	82.7
Germany	80.1	80.2	80.3	80.5	80.6	80.7	80.6	81.2	80.7	81.0
Greece	79.7	80.2	80.4	80.6	80.8	80.7	81.4	81.5	81.1	81.5
Hungary	73.6	74.2	74.4	74.7	75.1	75.3	75.8	76.0	75.7	76.2
Ireland	79.7	80.2	80.2	80.8	80.9	80.9	81.0	81.4	81.5	81.8
Italy	81.6	81.7	81.8	82.2	82.4	82.4	82.9	83.2	82.7	83.4
Latvia	70.8	72.1	72.8	73.1	73.9	74.1	74.3	74.5	74.8	74.9
Lithuania	70.7	71.7	72.9	73.3	73.7	74.1	74.1	74.7	74.6	74.9
Luxembourg	79.5	80.7	80.8	80.8	81.1	81.5	81.9	82.3	82.4	82.7
Malta	79.9	79.7	80.4	81.5	80.9	80.9	81.9	82.1	82.0	82.6
Netherlands	80.4	80.5	80.9	81.0	81.3	81.2	81.4	81.8	81.6	81.7
Norway	80.6	80.8	81.0	81.2	81.4	81.5	81.8	82.2	82.4	82.5
Poland	75.4	75.6	75.9	76.4	76.8	76.9	77.1	77.8	77.5	78.0
Portugal	79.3	79.5	79.7	80.1	80.7	80.6	80.9	81.3	81.3	81.3
Romania	73.1	73.5	73.7	73.7	74.4	74.4	75.1	75.0	75.0	75.3
Slovakia	74.6	74.9	75.3	75.6	76.1	76.3	76.6	77.0	76.7	77.3
Slovenia	78.4	79.1	79.4	79.8	80.1	80.3	80.5	81.2	80.9	81.2
Spain	81.1	81.5	81.9	82.4	82.6	82.5	83.2	83.3	83.0	83.5
Sweden	81.1	81.3	81.5	81.6	81.9	81.8	82.0	82.3	82.2	82.4
United Kingdom	79.7	79.8	80.4	80.6	81.0	81.0	81.1	81.4	81.0	81.2

Data sources: Based on the information retrieved on May 27, 2018, from EUROSTAT, [9].

The data from this table highlights the clear trend of increasing of the life expectancy in Romania, which from a level of 73.1 years in 2007 increase to 75.3 years in 2016. Despite all these positive developments in Romania's life expectancy, however, the level recorded in our country was constantly below the EU28 average (79.1 years in 2007 and 81.0 years in 2016).

Life expectancy at birth in the EU 28 member states, in 2016 (years)

Figure 4



Data sources: Based on the information retrieved on May 27, 2018, from EUROSTAT, [9].

Among the countries of the European Union with a higher life expectancy in 2016 (Figure 4), which also contributed to the higher level of the EU28, are Spain (83.5 years), Italy (83.4 years), France (82.7 years), Cyprus (82.7 years), Luxembourg (82.7 years).

An interesting aspect to be highlighted is that of the different growth between the EU Member States in the last decade. Thus, the highest increase in life expectancy at birth, over four years, in just 10 years, was recorded in Estonia (+4.8 years), Lithuania (+4.2 years) and Latvia (+4.1 years). The smallest increase (under one year) was recorded in Germany (+0.9 years). Life expectancy in Romania in the last decade has increased by 2.2 years.

From the point of view of the place that Romania occupies within the EU28, regarding the life expectancy at birth, the situation is highlighted also in figure 4. Compared to Romania, only 3 countries had a lower life expectancy in 2016: Latvia (74.9 years), Lithuania (74.9 years) and Bulgaria (74.9 years). Of course, the ranking itself is not the most relevant in this comparative analysis but the worse situation in which Romania is in the European context and which requires urgent intervention measures to improve it. Increasing life expectancy is an important objective for public policies, especially in the areas of health care, education, and other social services, to contribute to improving the quality of life of the population and achieving more favorable lifetime values.

Analyzing the Eurostat data on life expectancy at birth, by sex, in the EU member countries (Table 6), we find that in all cases, women have a higher life expectancy than men, in average with 5.4 years (in 2016).

Discrepancies regarding the life expectancy at birth by sex, in Romania and the EU28 Member States, in 2016 (years)

Table 6

GEO/TIME	2016			
	Total	Males	Females	Differences between females and males
European Union 28	81.0	78.2	83.6	5.4
Austria	81.8	79.3	84.1	4.8
Belgium	81.5	79.0	84.0	5.0
Bulgaria	74.9	71.3	78.5	7.2
Croatia	78.2	75.0	81.3	6.3
Cyprus	82.7	80.5	84.9	4.4
Czech Republic	79.1	76.1	82.1	6.0
Denmark	80.9	79.0	82.8	3.8
Estonia	78.0	73.3	82.2	8.9
Finland	81.5	78.6	84.4	5.8
France	82.7	79.5	85.7	6.2

Germany	81.0	78.6	83.5	4.9
Greece	81.5	78.9	84.0	5.1
Hungary	76.2	72.6	79.7	7.1
Iceland	82.2	80.4	84.1	3.7
Ireland	81.8	79.9	83.6	3.7
Italy	83.4	81.0	85.6	4.6
Latvia	74.9	69.8	79.6	9.8
Lithuania	74.9	69.5	80.1	10.6
Luxembourg	82.7	80.1	85.4	5.3
Malta	82.6	80.6	84.4	3.8
Netherlands	81.7	80.0	83.2	3.2
Norway	82.5	80.7	84.2	3.5
Poland	78.0	73.9	82.0	8.1
Portugal	81.3	78.1	84.3	6.2
Romania	75.3	71.7	79.1	7.4
Slovakia	77.3	73.8	80.7	6.9
Slovenia	81.2	78.2	84.3	6.1
Spain	83.5	80.5	86.3	5.8
Sweden	82.4	80.6	84.1	3.5
Switzerland	83.7	81.7	85.6	3.9
United Kingdom	81.2	79.4	83.0	3.6

Data sources: Based on the information retrieved on May 27, 2018, from EUROSTAT, [9].

What we have noticed when discussing about specific mortality rates by sex, for Romania, is valid for all EU28 states. Differences in life expectancy between women and men are determined by both biological and behavioral factors. As a rule, men tend to adopt more risk behaviors, which is highlighted by higher mortality rates for men for causes of death due to accidents, alcohol or tobacco use. Gender inequalities in life expectancy at birth are very different depending on countries.

In 2016, the largest differences (over 10 years) were registered in the Baltic countries and in the countries of south-east and central Europe (6-9 years). The smallest differences are found in Cyprus, Sweden and the Netherlands (under 4 years). In the case of Romania, the life expectancy was in 2016, 71.7 years for men and 79.1 years for women, thus greater with 7.4 years.

Conclusions

The mortality phenomenon in Romania, expressed by the crude death rate, has recorded in the last decades between 11 and 12 deaths per 1000 persons, with a slight increase in the period 2007-2016.

The analysis of the mortality by sex revealed the phenomenon of male supramortality, the male mortality rate surpassing, on average, the female mortality rate of 1.8 ‰.

By residence area, differences in mortality rates are even higher, the level of the mortality rate in rural being higher by an average of 4.0 ‰. More serious is the fact that in the case of the rural area the mortality rate registered a trend of growth during 2007-2016.

From the point of view of the crude death rate, Romania is in an unfavorable situation, this level being on average by 3.0 ‰ higher compared to the level recorded for the EU28. The progress registered in Romania in terms of quality of life, health care and changes in age structure of the population, contributed to the increase of the life expectancy at birth, which reached 2016 at 75.3 years compared to 73.1 years in 2007.

Given the important role of mortality in population growth or decline, as well as its influence on age structure and life expectancy of the population, measures are needed to reduce the mortality rate. An important factor, with a direct influence on the reduction of mortality, is the increase in the employment rate of the population and the increase of its income. Acting in these two directions allows the raising of the educational level of the population, increased access to health services, the possibility of adopting a healthy diet from the food point of view.

Another direction of action, in order to reduce the mortality of the population, is to increase the share of expenditures for education and health in the state budget, to adopt measures for the reduction of pollution, etc.

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