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Live births trend in Romania: 2007-2025 alternative projection

Abstract

Objective. *The aim of the present study is to describe demographic trend of the number of live births in the period 2007-2025 while maintaining specific patterns of fertility and mortality by age group in starting year.* ***Methods.*** *To achieve the projected number of births expected in each of the years 2007-2025 we used the cohort-component method that can provide an indication of evolution of the future population.* ***Results.*** *Fertile female quota deteriorates rapidly over the next years, with an average rate of deterioration of 46583 women/year. The number of live births should be a projected annual rate of decline of around 4000 live births.* ***Conclusion.*** *Appropriate public policies are needed in the near future to control the population decreasing.*

Keywords: *fertility model, live births projections*

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Introduction

The demographical changes have profound economical and social implications on the future development of a population. While an increase of life expectancy is considered to be a major realization of the European community, a decrease in birth and fertility, and the consequences of this decrease, the population is aging, are all challenges which the European Union must cope with[1].

Within this context, the politicians declare, conversely, their concern towards the actual demographical evolution, and their interest for identifying practical solutions for a recovery of this situation. However, the identified solutions are rather limited[2], and it is needed to realize and implement public and social policies which should take into account both a demographical recovery, as well as a recovery of the consequences which the current demographical evolution has. Although there are common demographical subjects for the entire Europe, reducing the number of marriages, increasing the average marriage age, reducing the number of live births[3], while looking for solutions which would be universally applicable, it is firstly needed to understand the national conditions, and to further identify solutions which could be applied in other states, in which there are different socio-economical and cultural contexts.

Romania, as a member of the European Union, is no exception regarding the demographical evolution: the birth rate has registered a tendency to decrease, and the fertility rates as well. The demographical evolution is influenced by multiple factors, and for this reason the potential political measures must take into consideration to influence them, based on a good knowledge of the consequences of non-intervention. The working hypotheses are the followings:

- decrease in the number of live births will continue in the period 2007-2025 in the conditions of maintaining the fertility model for year 2007, and
- the main agent of the decrease of live births within the 2007-2025 period is the modification (numerical decrease) of the actual generations of fertile age.

Methods

The analysis data was chosen for the year of 2007 due to the fact that during this year, the generation of women who were born in 1967 (the adult generation of the year right after Decree no. 770/1966, a decree through which there have been forbidden abortions on request) reached the age of 40 years old, thus reaching the groups of age which are usually characterized by the lowest specific fertility rates. In order to realize the projection of the number of live births to be expected every year during 2007-2025, the cohort-component method has been used[4]. The technique used ensures the orientation towards evolution of the population; considering that the conditions used for projection will be kept. The technique took into account the fertility and death models specific on groups of age in 2007, yet it did not take into account the migration phenomenon.

As stages for achieving demographical projections, were realized the following:

1. Building the data base, determining the specific fertility and death rates on groups of age annually.
2. Applying the model of specific mortality on groups of age.
3. Estimating the effective female population of fertile age.
4. Applying the model of specific fertility on groups of age.
5. Estimating the population of expected live births.

Building the data base was initiated by the annual distribution on groups of age in the year 2007 of the female population of fertile age, to which there were added the data on the number of deaths and number of live births in 2007[5]. The annual specific fertility rates for females have been determined by applying the number of live

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births observed on annual groups of age of the mother, to the actual female population on annual groups of age in 2007. The annual specific death rates for females have been determined by applying the number of deaths observed in 2007 to the actual female population on annual groups of age in 2007.

It were considered that the effective female populations (annual cohorts) will reach the next age year by being subjected to the mortality phenomenon according to the specific death model on groups of age for the females. This was applied for estimating the effective female quota of fertile age until 2023. In order to determine the effective female numbers of age 15 during the following years (2024 and 2025 years) there were considered the little girls born in 2008, respectively 2009, who were also subjected to the specific death rates on groups of age for females in 2007.

These actual female populations of fertile age the specific fertility rates on annual groups of age have been applied in order to estimate the number of expected live births, while taking into account the conditions of preserving the model of specific fertility model for annual groups of age in 2007.

In order to estimate the evolution of the female quota of fertile age, an average rhythm of increase/decrease has been calculated, by using the method which derives from the economical statistics of determining it[6].

Results

In order to determine the potential evolution of the number of live births for the following 18 years in comparison to 2007, we have used as a starting point the data which refers to the effective female population, starting with the female live births up to the females of age 49 until 2007, using the data from the Eurostat database[5].

Therefore we used the Eurostat database, which refer to the number of deaths registered in 2007 for each annual group of age, starting with the number of deaths registered for 1-year-old little girls to the deaths registered for females of age 49. Based on these data, there could be determined the rates of specific mortality on groups of age for females between 1 and 49 years for the year 2007. Moreover, were taken into consideration the effective female population on annual groups of age observed for 2007 year and the effective female population on annual groups of age observed in 2012 will reach in the following years the next groups of age, taking into account the mortality phenomenon. Thus, the women of age 15 in 2007 have been subject to the specific rate of female mortality in 2007 year, in order to determine the number of females who have reached the age 16 in 2008 year. The 1-year-old little girls in 2007 year have been subjected to the mortality pattern specific for 2007 year in order to determine the number of little girls who have survived and reached the age of 2 in 2008 year (the following year), age 3 in 2009 year, age 4 in 2010 year, and so on.

In order to determine the female population of age 15 in 2024 year, were taken into consideration the real number of little girls aged 1 in 2008 year, while for the female quota of age 15 in 2025 year were taken into consideration the population of little girls aged 1 in 2009 year, whom were subjected to the model of specific mortality on groups of age in 2007.

Thus, the evolution of the female quota of fertile age is based on real, observed data, in 2007, which is being estimated to maintain the model of specific mortality on annual groups of age in 2007.

In these conditions, a drop in the fertile feminine quota is continuous until 2025. In 2007, the fertile quota would have had 5520491 women of fertile age, in the year 2010 the quota would have decreased to 5402683, and in 2011 to 5336993 persons. The decrease is even more accentuated starting 2017. In 2015 should be registered 5295097 women of fertile age, and in 2020 the number of women who are of fertile age would decrease to 5158826. Until 2025 the deficit in women would increase, thus the fertile quota will reach 4775162 women of fertile age. The evolution forecast of the female quota of fertile age is represented in Figure 1.

In order to highlight the potential demographic loses in the number of women of fertile age, we determined the difference between the total of female population that is of fertile age which would be foreseen for the 2007-2025 period in comparison to the real effective numbers registered in 2007.

Thus, the shortage expressed in number of people would be 117808 women of fertile age in 2010, which would double by 2015, reaching 225394 women of fertile age less, while in 2020 the deficit would again double until reaching the value of -361665 women of fertile age, whereas in 2025 the deficit would be -745329 women of fertile age. These data suggest a fast impairment of 46583 women per year. The average rhythm of decrease has been determined by dividing the difference between women of fertile age foreseen for 2025 and the ones observed in 2007 by 16; 16 is the number of years between 2007 and 2005, minus 1.

Furthermore, starting from the evolution of the volume of female quota that is of fertile age during 2007 till 2012, and applying the model of specific fertility on groups of age in 2007, we would reach a potential evolution of the number of live births.

This suggests a continuous impairment which is approximately constant throughout the following 18 years. If in 2007 the number of live births is 215066, in 2015 the impairment would increase by 24950 live births in comparison with 2007. In 2020, the expected number of live births would be 176656, and the impairment compared to 2007 would be 38409, thus in 2025 the impairment would reach 61262 live births (153703 live births foreseen for 2025). An appreciation on the fact that throughout 20 years the number of live births will decrease by over 50000 live births could be made, which would translate to a decrease rhythm of almost 4000 (more precisely 3835) live births each year. This forecast evolution is diagrammatically presented in Figure 2.

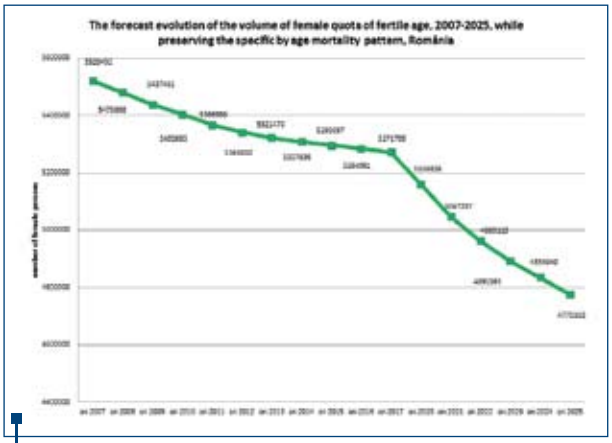

Figure 1. The forecast evolution of the volume of female quota of fertile age in 2007-2025 period, linear diagram

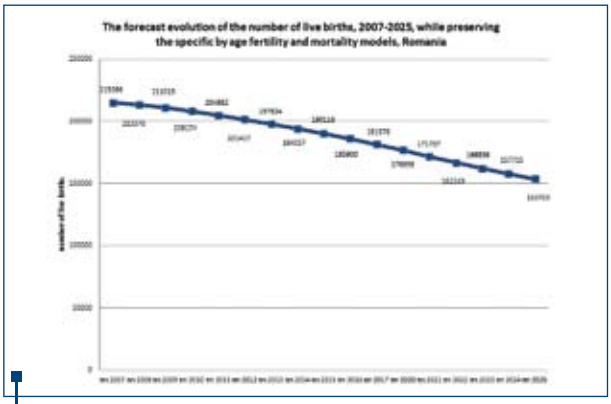

Figure 2. The forecast evolution for the number of live births foreseen for the 2007-2025 period, conditioned by maintaining the 2007 year model of specific fertility on groups of age and the 2007 year model of specific mortality on groups of age

Discussion

In order to discuss on the potential demographical evolution, there should be also taken into account that the population of fertile age in Romania is decreasing; the obtained results highlight the evolution which is constantly decreasing for both the female population of fertile age, and the number of live births. There are three phenomena which have a negative influence on the demographical evolution at national level, namely:

a. Increase of the dominance of the less numerous generations who were born after 1989, generations which already participate to the fertility phenomenon (the generation of 1990 reached the age of 20 in 2010) and will be dominating the population of fertile age in the future;
b. The adult generations that were born after 1966 will leave the structure of the fertile population (the 1967 generation reached the age 40 in 2007);
c. The unprecedented decrease in the birth phenomenon: the level of birth has registered a decrease market under the level of the birth rate registered in the year 1965, when the state took extreme measures in order to control the phenomenon.

Considering that data from 2007 for specific fertility and mortality should be maintained, the volume of female quota of fertile age will decrease fast throughout the following years, reaching an average decrease rhythm of approximately 45000 women per year. Using a comparison, each year, the female population in Romania loses a number of women which is approximately equal to the population of a big city in our country which have a number of inhabitants of approximately between 40000 and 45000 persons[7].

In the following 20 years, the number of live births will decrease by over 50000 live births, which would mean a decrease rhythm of approximately 4000 of live births each year.

Taking into account the number of people, we can state that each year, Romania loses a number of live births equivalent to a smaller city in Romania, such as: Aninoasa, Baia de Arieș, or Sulina (more precisely, 3835)[7].

Conclusions

Considering these conditions, we find that the demographical changes in the last period of time will constitute a political issue of maximum importance for the following decades.

Taking into account the European context, it is necessary that in Romania would be granted an increased attention towards highlighting the demographical changes, understanding the sources of these evolutions, and the potential consequences on the entire nation. Understanding them is a first step in identifying the most appropriate and efficient possibilities for intervention at the level of public policies.

Due to all of these, it is necessary to identify the most efficient measures of intervention, thus the negative consequences of the evolution forecast to be prevented. Amongst the unintended consequences of the evolution forecast there is also the decrease of the proportion of people who work and support the system of health and social insurances and the public pensions system. All of this generates uncertainty regarding the financial sustainability of the stated systems, due to the fact that the main principles that sustain the given systems might be at risk (contribution, equity, and social). Also, the family planning and obstetrics services must take into account such prognoses, in order to adapt the volume and quality of these services to the characteristics of the population which is served. ■

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