MANAGEMENT RESEARCH AND PRACTICE
VOLUME 9, ISSUE 1, MARCH 2017

AGING POPULATION IN THE EUROPEAN UNION CAUSED BY THE IMPACT BIRTH VS DEATH

Andreea Gabriela ZOTA
Academy of Economic Studies, Bucharest, Romania
andreeazota.ase@yahoo.com

Abstract
People from the European Union are living longer than before, as a result, population growth is slowing down, while population aging accelerates. Having this as a starting point, the purpose of the article is to investigate birth and death in parallel, in order to obtain a prediction on the number of live births and the crude death rate, for the upcoming decades. The method used was simple linear regression and it revealed a consistently decrease on both health indicators, reaching an almost equal value in 2035. Postponing childbirth until a women reaches the age of 30 and growing, consistent rise in the number of abortions among adolescent girls, diminution of the fertile population versus surging population over 65 years old, are all factors that explain the aging of the European population.
Keywords: Population aging, Live births, Death Rate, Burden, Health system.

1. INTRODUCTION

The dynamics of the entire world population is globally influenced by two natural phenomena: birth and death. A healthy life cycle is defined by a natural balance between the number of children born and the number of deaths that occur in a period of time.

When births are highly surpassing deaths, there is a natural increase that could lead to overpopulation, and when the number of deaths outgrows the number of births, it implies a natural decrease of the population density level. Therefore, it is necessary for every nation to take measures in balancing the pillars that sustain the natural order, such as: a well-functioning healthcare system, advanced elder care planning, effective investments in education and family planning.

Nowadays the European Union faces a continuous decline in the number of deaths as well as in the number of births, which conducts to population aging. Moreover, the European population is projected to decrease continuously in the upcoming decades (Eurostat, 2016). The aim of this study is to indicate the extent to which the number of live births could be affected by the decreasing number of fertile women, in contrast to the predicted deaths by the population over 65 years old.

ISSN: 2067 – 2462
www.mrp.ase.ro

2. LITERATURE REVIEW

Lower birth rates and higher life expectancy are evidences for the aging of the European population. The proportion of people at working age is consistently decreasing, while the number of those at retiring age is increasing, therefore, the burden on the working people to provide for the elders, will expand even more in the upcoming years (Eurostat , 2016).

There are many factors that might have influenced the population dynamics in time. Migration – usually people who migrate are younger than the non-migrants, therefore the aging process might be accelerated in countries with higher numbers of migrants, while the countries of destination are rejuvenated. Another important factor could be the „baby boom" after World War II that influences the statistical data about the elders nowadays (Rechel et al., 2013).

All the European Union countries should take immediate actions and long-term care, health-care and welfare systems need to adapt accordingly. Although the old-age dependency ratio can not shed a light on who is working or not, because many aged 15-64 are unemployed, whilst many aged 65 or more are still economically active, the increase in the number of elders can cause many issues in the system. A pressing issue can be defined by the difficulty of the young to financially provide for the pensions of the elders (Rechel et al., 2013).

The young age dependency ratio is projected to slightly increase to 25% in 2060 from 24% in 2015, while the old age dependency ratio is expected to extensively rise up to 53.5% in the same year, from 29% in 2015 (Giannakouris K., 2008). In 1960 the percentages for the dependency ratio were substantially different: young: 40% and old: 15% (The World Bank).

Pension policies are challenged to maintain a sustainable system, in order to deliver proper retirement incomes and to provide the change for decent living standards, as they also represent nowadays more than 10% of GDP (European Commission, 2012).

Beside the economic aspect, health also plays a prominent role in the well-being of the elderly. Severe disability and functional limitations among the elderly population has been decreasing in the last decades. There are also gender differences in health status, as the men are more likely to die when the health deteriorates, than women. Another factor that can influence the well-being is the family environment. Despite the perception that living in a multigenerational household is a way to help the elders physically and emotionally, elders from Eastern Europe, living with younger family members, feel lonelier and more depressed than those from Western Europe. This can be explained by the social and economic effects of the socialist regime in the eastern European counterparts (European Commission, 2014).

3. DESCRIPTIVE STATISTICS

The natural phenomena is endangered: in the European Union, during 2001 and 2014, 10.46 births and 9.82 deaths on average per 1,000 population were reported, meaning that the number of births is slightly surpassing the number of deaths. Furthermore, the fertile population (female, age group: 15 – 49) started decreasing in the last 5 years, whilst the population over 65 years old is continuously growing. As a result, the healthcare system could be overwhelmed during the following years by the large number of deaths, in comparison to the insufficient number of births.

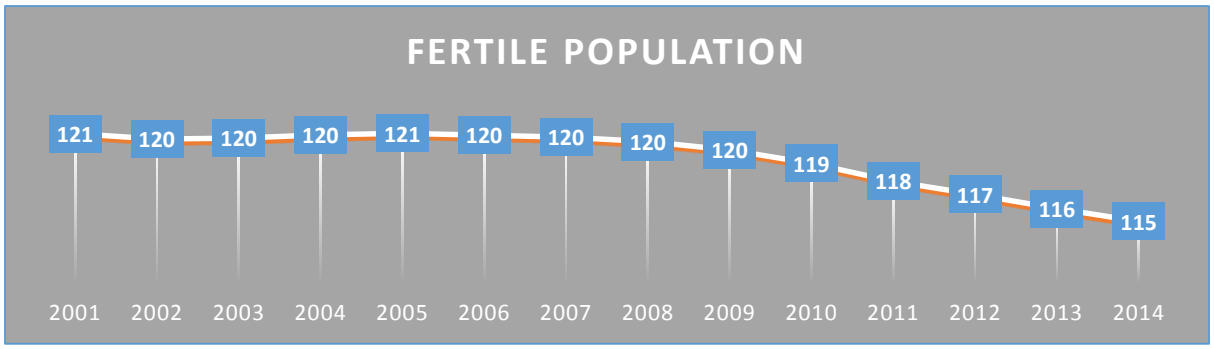

FIGURE 1 - FEMALE POPULATION IN THE 15-49 AGE GROUP, FROM THE EUROPEAN UNION. UNIT: MILLIONS. DATA SOURCE: HTTP://EC.EUROPA.EU/EUROSTAT.

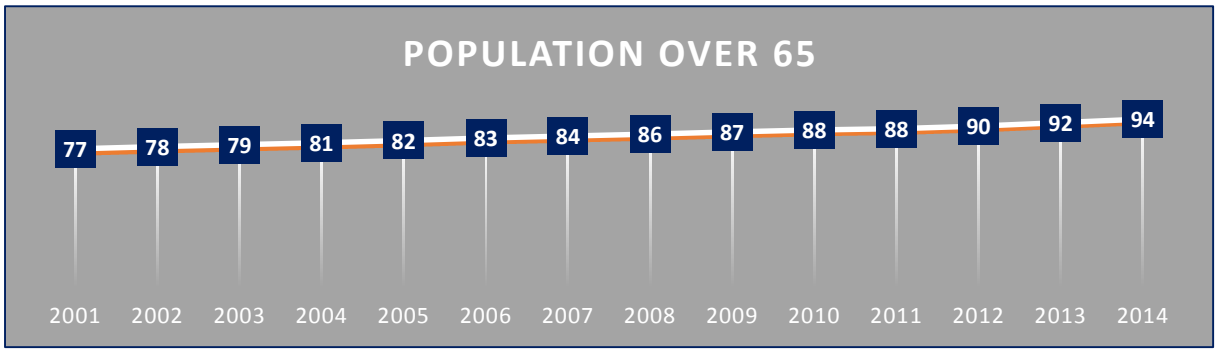

FIGURE 2 - POPULATION OVER 65 YEARS OLD, FROM THE EUROPEAN UNION. UNIT: MILLIONS. DATA SOURCE: HTTP://EC.EUROPA.EU/EUROSTAT.

These concerning figures must raise many questions for specialists, as well among ordinary civilians. For example, how can the health system sustain the discrepancy between the young and the old? Will there be enough youth, enough workforce to sustain an entire system? Who will pay for our pensions when we will retire? Why people postpone so much to give birth to their first child?

Needless to say, a proper analysis of the socio-economic factors that could determine the burden of the health system must be a high priority for every state in the world, in order to find the proper ways to promote maternity and to take good care of the elders.

ISSN: 2067 – 2462
www.mrp.ase.ro

3.1. Birth

Women nowadays postpone marriage and birth. Depending on the education level, they prefer to reach a certain point in their career plan, before pursuing the family path. This could also be explained by the financial benefits that comes with the maternity leave, that are different for every European country.

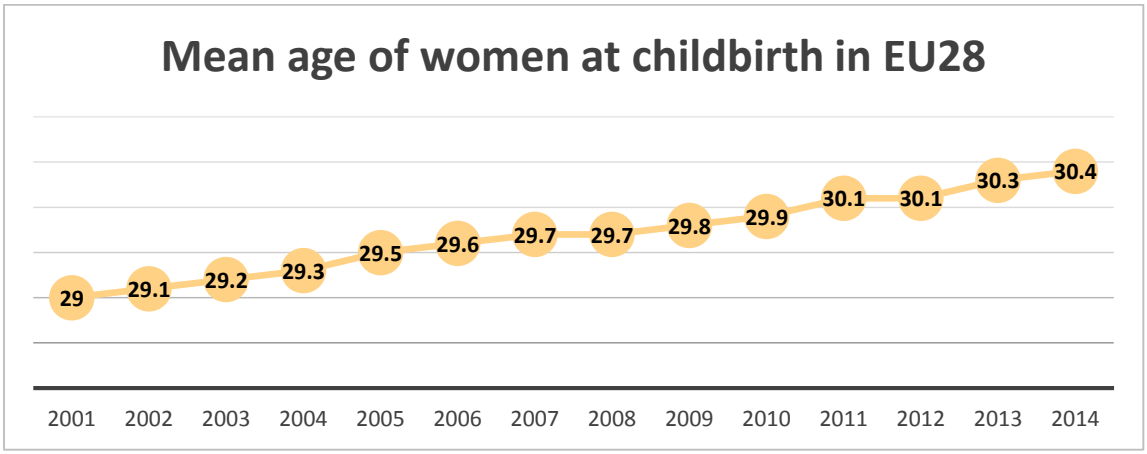

FIGURE 3 - THE MEAN AGE OF WOMEN AT CHILDBIRTH, FROM 2001 TO 2014 IN EU-28. DATA SOURCE: HTTP://EC.EUROPA.EU/EUROSTAT.

Postponing birth also implies the aging of the generations, for example: if nowadays our grandparents live to see their great-grandchildren, in the near future this might not be possible. As seen in Figure 4, most women give birth while they are 30 - 34 years old, and the number of live births given by mothers aged in the 35 – 39 age group is slightly exceeding those being 20 to 24 years old.

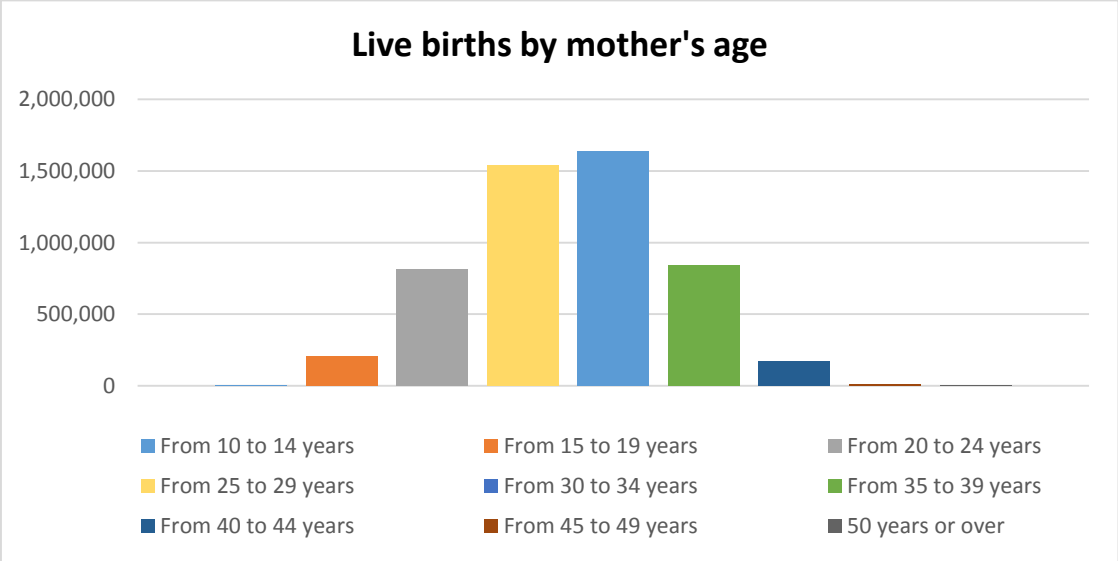

FIGURE 4 - AVERAGE NUMBER OF LIVE BIRTHS BY MOTHER'S AGE, FOR THE 2001-2014, IN EU-28. DATA SOURCE: HTTP://EC.EUROPA.EU/EUROSTAT.

A major impact on the fertility of the European Union in the last decades has been the number of abortions that is constantly increasing in adolescent girls, despite having access to information about contraceptive methods and sexual education, a privilege that was not so accessible in the past. In 2007 and 2011, there were 1144 abortions performed to women younger than 20 years old, per 1,000 live births.

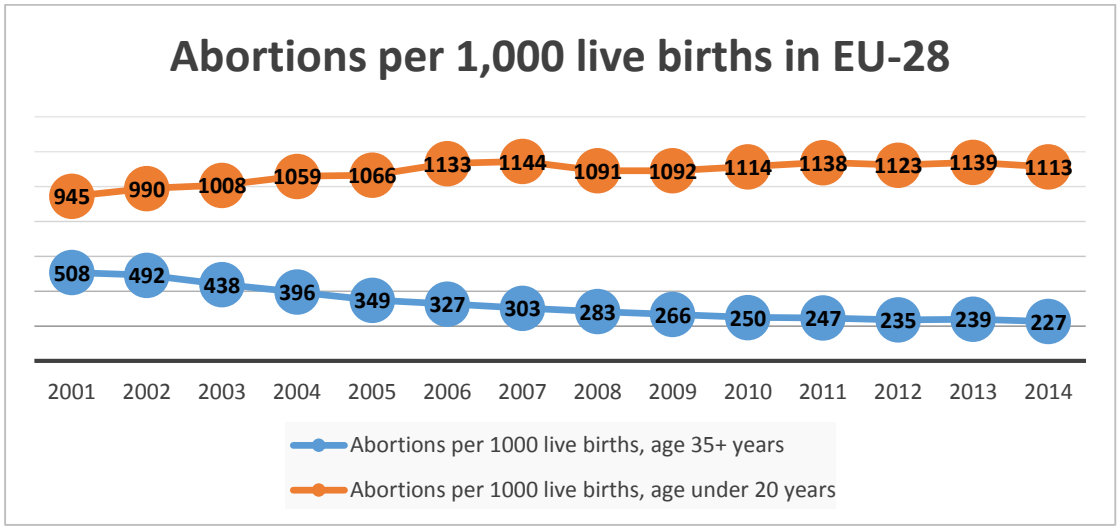

FIGURE 5 - ABORTIONS PER 1,000 LIVE BIRTHS, FOR ADOLESCENT GIRLS VS WOMEN AGED 35+, IN EU – 28. DATA SOURCE: HTTP://DATA.EURO.WHO.INT

3.2. Death

Life expectancy at birth has known a major increase in the last decade. If a person was expected to live 77.74 years since birth in 2001, life expectancy reached 80.87 in 2014.

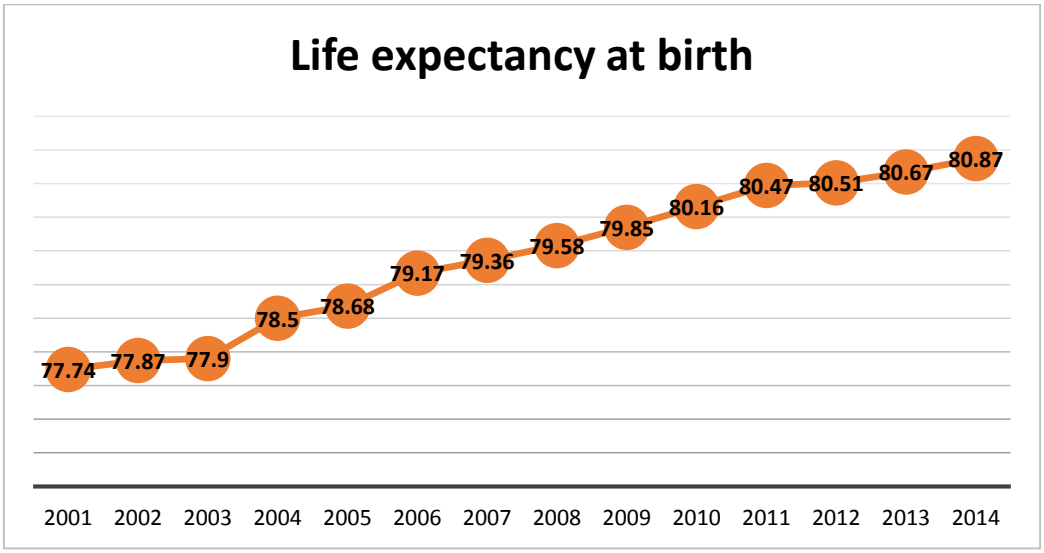

FIGURE 6 - LIFE EXPECTANCY AT BIRTH, FOR PEOPLE LIVING IN EU-28. DATA SOURCE: HTTP://DATA.EURO.WHO.INT

High life expectancy, low death rate and decreasing number of live births, are factors that explain the aging of population nowadays and the emphasis that must be put on maternity health-care and family planning.

ISSN: 2067 – 2462
www.mrp.ase.ro

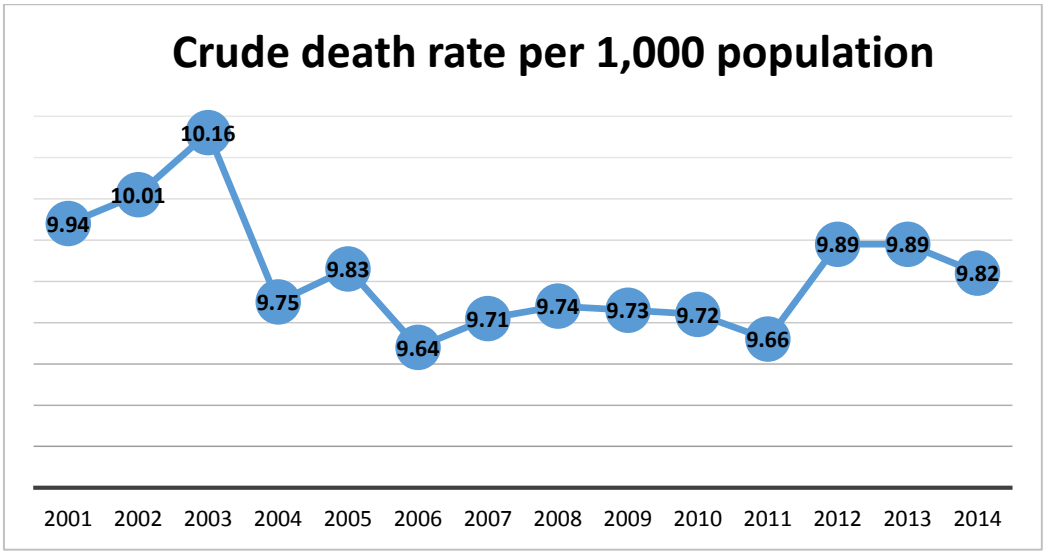

FIGURE 7 - DEATH RATE PER 1,000 POPULATION IN EU-28. DATA SOURCE: HTTP://EC.EUROPA.EU/EUROSTAT

4. MATERIALS AND METHODS

This article is presenting a projection of the number of deaths and live births per 1,000 population, until 2035. Data was collected from Eurostat, The World Bank and World Health Organization for the European Union (EU-28) from 2001 to 2014,

In order to make an estimation for the next 2 decades, there were used the projections for the population of fertile women population (15-49 years old) – for the number of live births and the number of people (both men and women) over 65 years old – for the number of deaths.

The method used was: simple linear regression, with the following formula:

$y = \alpha + \beta * x_i$, where:

y = the dependent variable, x = the independent variable, α = the intercept , β = the slope, i = year.

The linear regression was performed using the IBM SPSS Statistics 20 software, for live births and the number of fertile women (for the first regression output) and crude death rate and the population aged 65+ (for the second regression output).

Every analysis has an issue to face: the existence of missing values. This could happen when countries fail to offer the necessary information to determine the value of an indicator per a certain year, whereas other countries do. The variables used for the database had less than 5% missing values, therefore, replacing them with the series mean represented a proper option.

5. RESULTS

Live births and the number of fertile women

Equation used to determine how the number of live births is affected by the number of fertile women, a prediction for 2015-2035:

y = 1.396 + 0.076*x_i.

y = number of live births per 1,000 population, x_i = number of females within the 15-49 age group for every i year (millions).

TABLE 1 - DESCRIPTIVE STATISTICS, LIVE BIRTHS PER 1,000 POPULATION AND FEMALE IN THE 15-49 AGE GROUP, SPSS OUTPUT

Descriptive Statistics

	Mean	Std. Deviation	N
Live_births_per_1.000_population	10.4643	.25603	14
pop_female_15_49	119.14	1.767	14

For the 14 years analyzed, during 2001 and 2014, there were on average 119 millions of fertile women in the European Union, and 10 births per 1,000 population (based on the entire population).

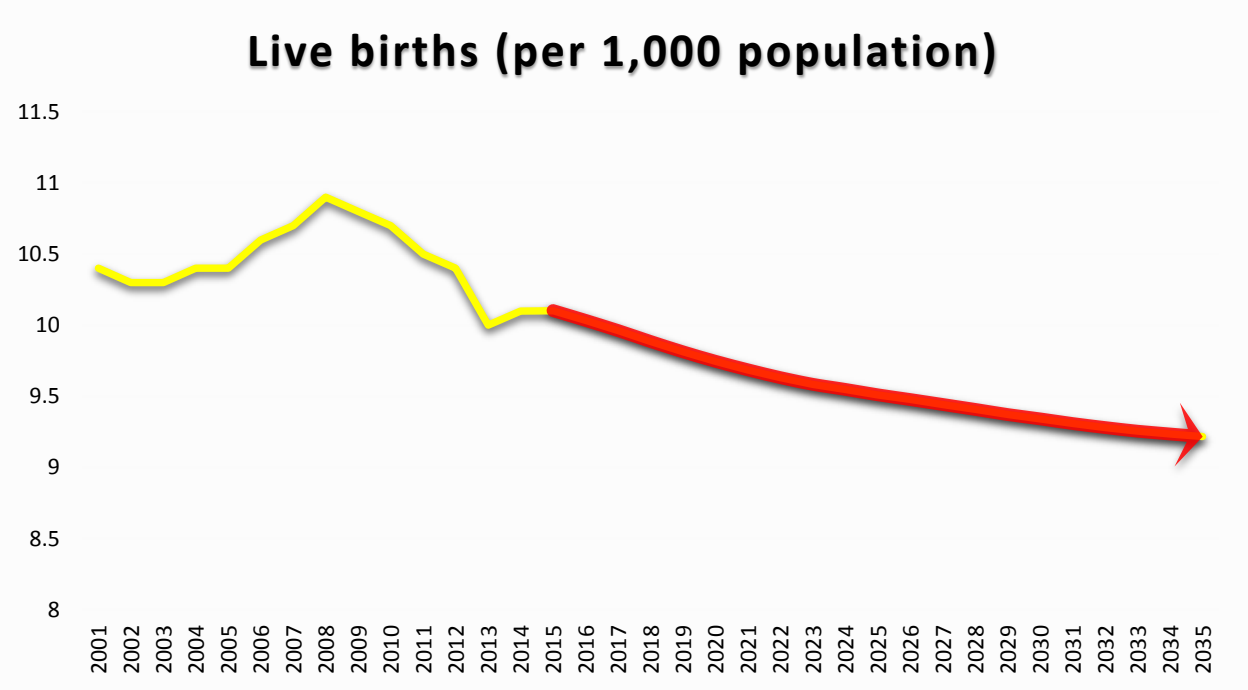

FIGURE 8 - ACTUAL AND PROJECTED NUMBER OF LIVE BIRTHS, 2001- 2035

Figure 8 explains the actual rate of live births per 1,000 population (yellow), versus the projection on the number of live births per 1,000 fertile women (red), which will continue to decline abruptly in the next 2 decades.

ISSN: 2067 – 2462
www.mrp.ase.ro

In 2008, one year after the global financial crisis started, the number of live births reached a peak value of 10.9 live births per 1,000 population, before falling consistently.

Crude death rate and the population aged 65+

Equation used to determine how the crude death rate is affected by the number of people over 65 years old, a prediction for 2015-2035:

y = 10.717 + (-0.011)*x_i.

y = crude death per 1,000 population, x_i = population over 65, for every i year (millions).

TABLE 2 - DESCRIPTIVE STATISTICS, CRUDE DEATH PER 1,000 POPULATION AND NUMBER OF PEOPLE OVER 65 YEARS OLD, SPSS OUTPUT

Descriptive Statistics

	Mean	Std. Deviation	N
Crude_death_rate_per_1000_population	9.82071	.145574	14
Pop_over65	85.0030	5.15316	14

In the European Union, was reported an average of 85 million people over 65 years old, and a mean of 9.82 deaths at 1,000 population (based on the entire population).

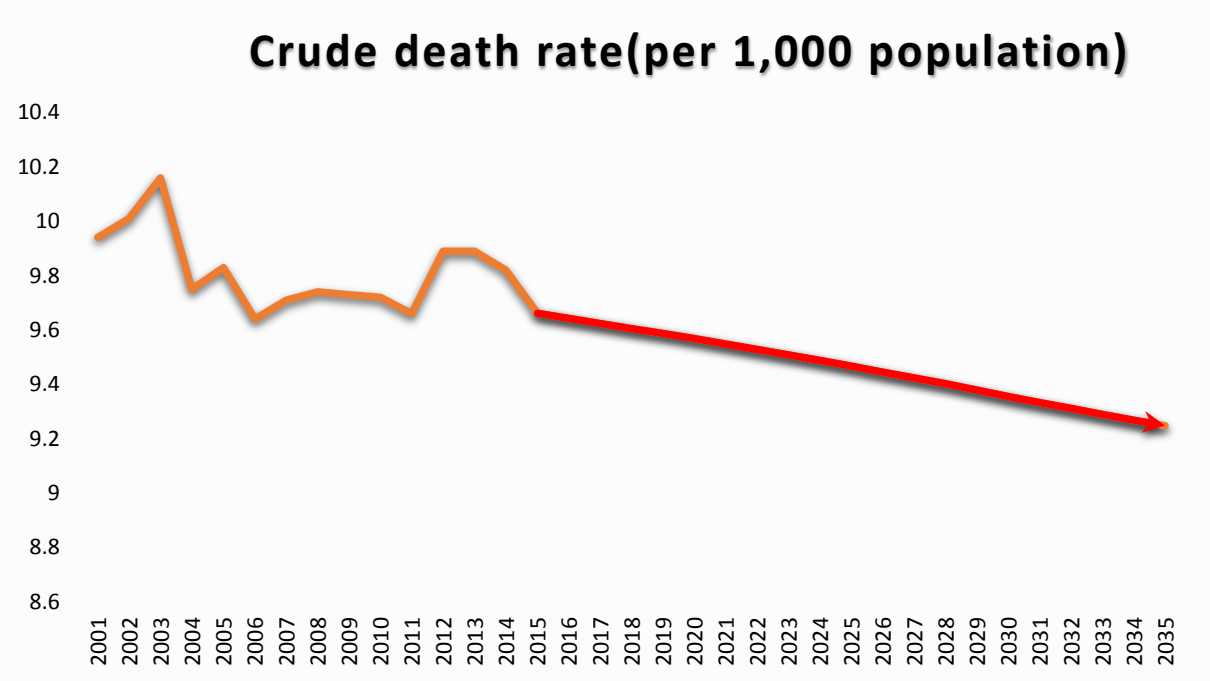

FIGURE 9 - ACTUAL AND PROJECTED DEATH RATE, 2001- 2035

As shown in Figure 9, crude death rate per 1,000 population has declined since 2003 and will continue to decline in the future 20 years, using the projection based on the population over 65 years old.

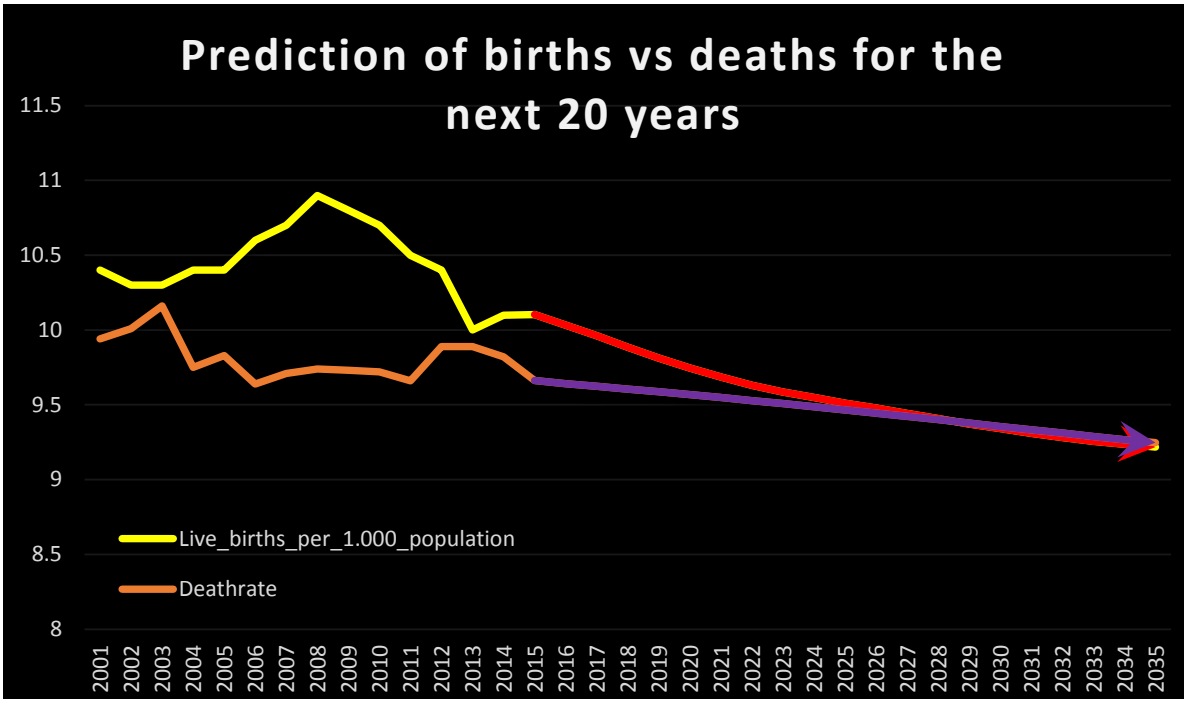

FIGURE 10 - PROJECTION ON LIVE BIRTHS VERSUS DEATH RATES IN THE 20 YEARS, 2015-2035

For a better perception, both results are seen concurrently in Figure 10. The number of live births, as well as the crude death rate will continue to decline during the next years, which implies the aging of population and demands urgent measures to be taken by the states of the European Union.

6. CONCLUSIONS AND RECOMMENDATIONS

The nowadays Europeans are living longer than before. Although this is a reassuring fact, every nation needs its youth, in order to be kept alive. At this point, there is no doubt that they have an aging population that will continue down this path for the coming decades. As a result, immediate actions must be taken to improve both natality and the elder care. European elders must have a decent environment to live in, and there must be solidarity between generations. Women must be encouraged to have more than one child when financially possible, and to stop postponing childbirth until they reach professional fulfillment.

REFERENCES

European Commission. (2012).White Paper: An agenda for adequate, safe and sustainable pensions. Retrieved from: http://eur-lex.europa.eu

Eurostat (n.d.). Retrieved from: http://ec.europa.eu/eurostat.

European Commission. (2014). Population aging in Europe: Facts, implications and policies. Retrieved from: https://ec.europa.eu/research/social-sciences/pdf/policy_reviews/kina26426enc.pdf

Eurostat. (2016). Population structure and aging. Retrieved from: http://ec.europa.eu/eurostat/statistics-explained/index.php/Population_structure_and_aging

ISSN: 2067 – 2462
www.mrp.ase.ro

Giannakouris K. (2008). Ageing characterises the demographic perspectives of the European societies. *Eurostat: Statistics in focus*, 72.

World Health Organization. Retrieved from: http://www.who.int

Rechel, B., Grundy, E.,Robine, J.M., Cylus J.P., Knai, C. and McKee, M. (2013). Ageing in the European Union. *Lancet*, *381*, 1312-22.

The World Bank (n.d.). Retrieved from: http://data.worldbank.org