

## The Life Expectancy and the Economic Conditions in Pandemic Context in EU

Adina Titei

“Ovidius” University of Constanta, Faculty of Economic Sciences, Romania  
[adinatitei@yahoo.com](mailto:adinatitei@yahoo.com)

### Abstract

*This study debates the life expectancy at birth in the pandemic context at EU level. Starting from the hypothesis that COVID-19 influences the health and the economic conditions for a large majority, we analysed if the life expectancy at birth and life expectancy at the 65 age are or not in decline at present due to the pre-pandemic period. Using descriptive methods, we identified which are the European countries where high mortality has led to significant reductions in life expectancy and, respectively, whether these reductions are higher among men than among women.*

*We find that COVID-19 has contributed to the reduction of life expectancy and has caused many years of life lost in most European countries. There are just few countries where life expectancy at birth increased or remained at the same level.*

**Key words:** life expectancy, pandemic context, COVID-19, European countries

**J.E.L. classification:** I10, J17

### 1. Introduction

The pandemic context influences all the aspects of our life, including life expectancy and new economic conditions. A brief look at the social conditions data in the European Union shows that Europeans had lower life expectancy in 2020 than in 2019. At the same time, the GDP per capita has declined and economic conditions do not seem to be favourable. This happened in almost all European countries after decades in which life expectancy and GDP per capita constantly increased.

In December 2021, the WHO reported more than 3.3 million deaths caused by COVID -19, attributed directly and indirectly, and the number is likely to be higher. In this context, we analyse the evolution of life expectancy at EU level, given that it could show us the impact of COVID-19 on health.

### 2. Literature review

Life expectancy is an indicator calculated as an average and it can be determined for different ages. The most popular is life expectancy at birth and it measures the mortality of a country, allowing comparisons between generations. This offers key information about the health, the welfare and the development level of a country.

McGranahan et al. proposed an index of socio-economic development that was composed of nineteen indicators, including life expectancy at birth and per capita-per day consumption of animal protein for measuring health. (McGranahan *et al*, 1972). Starting from that, Morris proposed the Physical Quality of Life Index (PQLI), which is calculated as an arithmetic mean of three indicators, including life expectancy (Morris, 1978).

Using the results of multivariate stochastic dominance and applying this technique for measuring the inequality, Atkinson and Bourguignon explored different aspects of this problem, especially when this includes more than one dimension. For 61 countries, they used indicators as the life expectancy and the international distribution of income in such a model and they

demonstrated that even if the marginal distributions are identical, there are different degrees of correlation. (Atkinson and Bourguignon, 1982)

The Human Development Index is one of the most important composite indices that include it. IDU is based on three dimensions: living standards, education and health. For the latter, life expectancy at birth is used, starting from the premise that a high level of human development means a long and healthy life (Anand and Sen, 1994).

Using a utility function for measuring full income, with life expectancy and income as indicators, Becker, Philipson and Soares found that the disparities in income decrease significantly when life expectancy is used (Becker *et al.*, 2005)

Fleurbay and Guillaume measured the living standards for 24 OECD countries, including life expectancy into indicators. They concluded that the GDP per capita is a very fragile indicator for comparisons about the living standards and it did not offer enough information. So, using other indicators as life expectancy, cost of unemployment or level of leisure as non-income dimensions, they obtained a different general ranking of countries than in the situation in which when only economic indicators is used. There are countries with similar living standards and similar social development models, but without similar characteristics for the economic development or for the income distribution (Fleurbay and Guillaume, 2009)

In 2010 Andersen made a study using the life expectancy and joint distribution of GNP per capita for poor and non-poor countries. The results show us an overall improvement for the situation of the poor in terms of polarization of income and life expectancy, an improvement based on the progress made by China and India. But comparing Africa and the Rest of the World he found that Africa's relative position is becoming progressively worse. (Andersen, 2010, p.97)

Jones and Klenow used life expectancy in a metric indicator for measuring social welfare considering that a long life means a high level of welfare, even if they appraise life expectancy as an imperfect indicator for measuring health. They found that cross-country inequality in welfare is greater than inequality in incomes. In the developing countries, the level of welfare is lower than the incomes, because of the shorter life expectancy and of the high level of inequality (Jones and Klenow, 2016).

Islam, N. *et al.* estimated, for 37 countries from all continents, the impact of Covid-19 pandemic on life expectancy and the changes in years of life lost. Using time series analysis, the study shows without doubt a reduction in life expectancy in almost all countries, with three exceptions. For three countries there is no modification of this indicator and for the other 31 countries the reduction in life expectancy was registered for both men and women. In this situation, more than 222 mill. years of life were lost in 2020, with a lower rate for women than for men. (Islam *et al.*, 2021)

In a recent study, Aburto *et al.* found that for 27 out of 29 countries, most European countries, the USA and Chile, the life expectancy at birth declined in 2020 and the largest loss was registered for male in the USA and Lithuania, 2.2 and 1,7 years respectively. The reduction in life expectancy was mainly in the age group over 60 years and this increase of mortality should make us think because it is comparable with the loses registered in the World War II. (Aburto *et al.*, 2021)

All these studies prove it to us that life expectancy is a widely used indicator to characterize health and the welfare. In the pandemic context, there have been significant decreases of life expectancy and many people have lost their lives, especially the elderly.

#### 4. Research methodology

In this paper we discuss about health in the pandemic context and the impact of Covid-19 to the life expectancy at EU level. The research method is preponderantly descriptive, with the aim of identifying those EU countries in which Covid-19 has produced significant decreases in life expectancy. Therefore, the hypotheses considered in the study are:

- Did Covid-19 influenced the reduction of life expectancy at EU level?
- If so, for which category, men or women, the effect is most significant?
- What happened with life expectancy at the age of 65 in 2020 compared with the previous year?

## 5. Findings

Life expectancy is one of the most widely used indicator that permits cross-nationally comparisons and offers a representation of the impact of the pandemic context on mortality. At EU level, after decades of increases in life expectancy, for the year 2020 was registered a decrease in life expectancy for almost all the EU countries. This phenomenon affects both men and women.

Table no. 1 Life expectancy in EU countries

Countries	Life expectancy at birth (years) 2016	Life expectancy at birth (years) 2019	Life expectancy at birth (years) 2020	Increase/Decrease of Life expectancy at birth (2020/2019) (years)	The gap for Life expectancy at birth for men (years) (2020/2019)	The gap for Life expectancy at birth for women (2020/2019) (years))	Increase/Decrease of Life expectancy at age 65 (2020/2019) (years)
Spain	83.5	84.0	82.4	-1.6	-1.4	-1.6	-1.6
Bulgaria	74.9	75.1	73.6	-1.5	-1.7	0.2	-0.9
Lithuania	74.9	76.5	75.1	-1.4	-1.5	-1.2	-1.2
Poland	78.0	78.0	76.6	-1.4	-1.5	-0.6	-0.6
Romania	75.2	75.6	74.2	-1.4	-1.4	-1.1	-0.7
Belgium	81.5	82.1	80.9	-1.2	-1.2	-1.2	-1.2
Italy	83.4	83.6	82.4	-1.2	-1.3	-1.0	-1.0
Czechia	79.1	79.3	78.3	-1	-1.1	-0.9	-0.9
Slovenia	81.2	81.6	80.6	-1	-0.9	-1.1	-1.1
Luxembourg	82.7	82.7	81.8	-0.9	-0.8	-1.0	-1.0
Slovakia	77.3	77.8	76.9	-0.9	-0.8	-0.8	-0.8
Portugal	81.3	81.9	81.1	-0.8	-0.7	-1.1	-1.1
Croatia	78.2	78.6	77.8	-0.8	-0.8	-0.7	-0.7
Hungary	76.2	76.5	75.7	-0.8	-0.8	-0.6	-0.6
Sweden	82.4	83.2	82.4	-0.8	-0.8	-0.6	-0.6
France	82.7	83.0	82.3	-0.7	-0.7	-0.6	-0.6
Netherlands	81.7	82.2	81.5	-0.7	-0.8	-0.6	-0.6
Austria	81.8	82.0	81.3	-0.7	-0.8	-0.7	-0.7
Greece	81.5	81.7	81.2	-0.5	-0.6	-0.5	-0.5
Estonia	78.0	79.0	78.6	-0.4	-0.3	-0.3	-0.3
Ireland	81.7	82.8	82.4	-0.4	:	:	:
Malta	82.6	82.9	82.6	-0.3	-0.4	0	0
Germany	81.0	81.3	81.1	-0.2	:	:	:
Cyprus	82.7	82.3	82.3	0	0.	-0.1	-0.1
Latvia	74.9	75.7	75.7	0	0.	0.	0
Denmark	80.9	81.5	81.6	0.1	+0.1	+0.1	+0.1
Finland	81.5	82.1	82.2	0.1	+0.1	+0.2	+0.2

Source: Eurostat database

For the EU countries in 2019 the life expectancy at birth ranged from maximum 84.0 years for Spain to 75.1 years in Bulgaria. In 2020 it decreased and ranged from 82.6 years for Spain to 73.6 years for Bulgaria. Also, for Romania life expectancy at birth decreased from 75.6 years in 2019 to 74,2 years in 2020.

Life expectancy at birth decreased in 2020 than in 2019 at EU level with more than one year for 9 countries. There are 14 countries in which the indicator decreased less than one year, two countries in which life expectancy has been maintained and just 2 countries in which life expectancy has increased.

From 2019 to 2020, women and men in 8 countries lost more than one year of life expectancy at birth. For exception, in Slovenia, Luxembourg and Spain life expectancy losses is wider for men than for women.

Life expectancy at the age of 65 decreased in 2020 than in 2019 at EU level with more than one year for 7 countries. There are 16 countries in which the indicator decreased less than one year, two countries in which life expectancy has been maintained and just 2 countries in which life expectancy has increased for this age group. There are also 2 countries with unavailable data.

Romania, one of the countries with the smallest life expectancy at birth at EU level, also registered decreasing values for this indicator in 2020. In fact, for the Romanian man life expectancy has decreased to 70.5 years in 2020 from 71.9 years in 2019. In the case of Romanian women, the situation is not good, life expectancy at birth was 78.4 years in 2020 compared with 79.5 years in 2019.

## 6. Conclusions

Life expectancy is an indicator that is part of many composite indices. Calculated as an average, the indicator shows us aspects of the quality of life and the level of health. Consequently, we can consider that a high level of this indicator means that the societal well-being and success are present in our life.

Life expectancy at birth declined in almost all European countries for men and women from 2019 to 2020 with some exceptions such as Finland and Denmark. The magnitude of declines in life expectancy at birth offsets most gains for the 5 years prior to the Covid-19 pandemic in EU countries.

It is important to specify that changes in life expectancy could be random especially for the countries with smaller population. Therefore, the ranking is affected by the pandemic context but at the same time by the randomness of death counts.

The pandemic context could still have a negative effect to life expectancy and to economic conditions. Moreover, we must consider that the population could die prematurely not only from the virus, but also from delayed treatment of other diseases.

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