

# CHANGES IN CAUSE-OF-DEATH MORTALITY TRENDS AND PATTERNS IN ROMANIA SINCE 1980

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## Abstract

After several decades of stagnation, mortality in Romania started declining after 1996. Unlike the Czech Republic or Poland that were the first to benefit from life expectancy growth after the fall of Communism, Romania immediately after the 1989 revolution faced a population health deterioration, especially among males. This study is based on the death time series reconstructed for Romania according to the 10<sup>th</sup> revision of the International Classification of Diseases and Causes of Death since 1980. The reconstructed mortality series assure their comparability across time. We focus our analysis on cause-of-death mortality trends and age- and cause- components of life expectancy changes. The reduction in cardiovascular mortality at adult and old ages is the main contributor to the increase in life expectancy after 1996. At the same time, this progress is accompanied by the lack of improvements for digestive diseases, while the very recent trends for infections and respiratory diseases are of concern. The observed changes in mortality trends are discussed through the prism of the health transition and in the context of changing public health policies and health-related attitudes and behaviours.

## Introduction

Although cause-of-death mortality analysis is a good tool for understanding the past and present epidemiologic situation in a country, for Romania that joined the European Union in 2007 there are very few researches with a focus on the evolution of cause-specific mortality. One of the main obstacles for such types of studies is the discontinuities in death time series induced by the periodic changes in the classification of causes of death. Thanks to the collaboration between the French Institut national d'études démographiques and the Romanian National Institute of Statistics, the detailed cause-of-death mortality data were collected for the period since 1980 and reconstructed under the detailed list of the 10<sup>th</sup> revision of the International Classification of Causes of Death (ICD-10).

This study is the first attempt to analyse the reconstructed cause-of-death death time series for Romania since 1980. Besides the general understanding of the changes in the Romanian population health since 1980, we want to answer to the following research questions:

1. Has the epidemiologic profile of mortality changed in Romania before and after the 1989 revolution?

2. What are the main age- and cause-of-death contributors to the life expectancy growth that has been observed in the country since 1997?

Our research hypothesis: The collapse of the Communist regime in Romania after the 1989 revolution did not bring immediate population health improvements. On the contrary, the health deterioration accelerated and continued until 1997 followed by a reduction in cardiovascular mortality.

## **Material and methods**

We used death time series reconstructed for Romania according to the detailed ICD-10 list (Ionita and Penina, 2016). The data were reconstructed by the method proposed by Meslé and Vallin (Vallin and Meslé, 1988) and retrieved from the Human Cause-of-Death Database (HCD) (<http://www.causesofdeath.org>) for the period 1980-2012. The reconstructed death time series were prolonged till 2016 (unpublished). Population exposures were also retrieved from the HCD for 1980-2012 (inter-census estimates) and prolonged by the official post-census estimates till 2016 (NIS of Romania, 2019). Mortality and population data for Poland, Ukraine and Moldova were retrieved from the HCD (HCD Database, 2019).

Age and cause-specific death rates were computed on the basis of population estimates extracted from the HCD Database. Age-standardization of cause-specific death rates is based on the 2013 European Standard Population. For the decomposition of a difference between two values of life expectancy, we use the method proposed by E. Andreev and V. Shkolnikov (Andreev and Shkolnikov, 2002).

## **Results**

Prior to the mid-80s, Romanian male life expectancy was highly comparable to other central and eastern European countries like Poland or Ukraine (*Figure 1*). This is not true for Romanian females who experienced more health problems and their situation was probably more similar to Moldovan females whose mortality rates were among the highest in Europe in the 1970s (Penina, 2017). From the mid-80s, there was a sharp distinction between central European countries on the one hand and the former USSR countries on the other. Poland together with the Czech Republic were the first former Communist countries in this region that experienced a rapid and sustainable life expectancy growth largely due to the reduction of cardiovascular mortality (Meslé, 2004; Fihel and Pechholdová, 2017). Romania joined this progress much later. In contrast to Poland, in Romania, after the 1989 revolution, there was a noticeable health deterioration in males and stagnation in females. It was only since the year 1997 that a stable increase in life expectancy has been registered in this country. Thus, between 1980 and 1996,

Romanian males lost 1.4 years of life expectancy (from 66.4 to 65.0), and Romanian females gained just 1.0 year (from 71.8 to 72.8). Between 1996 and 2016, Romanian life expectancy increased by 6.7 years in males and 6.3 years in females. Disregarding these ameliorations, the lag between Poland and Romania is still persistent and has even increased in females. These health improvements in eastern European countries are in a sharp contrast to the former Soviet republics, like Ukraine and Moldova, that demonstrated a continuing negative life expectancy trends in spite of wide fluctuations related to the social and economic circumstances until the very recent years.

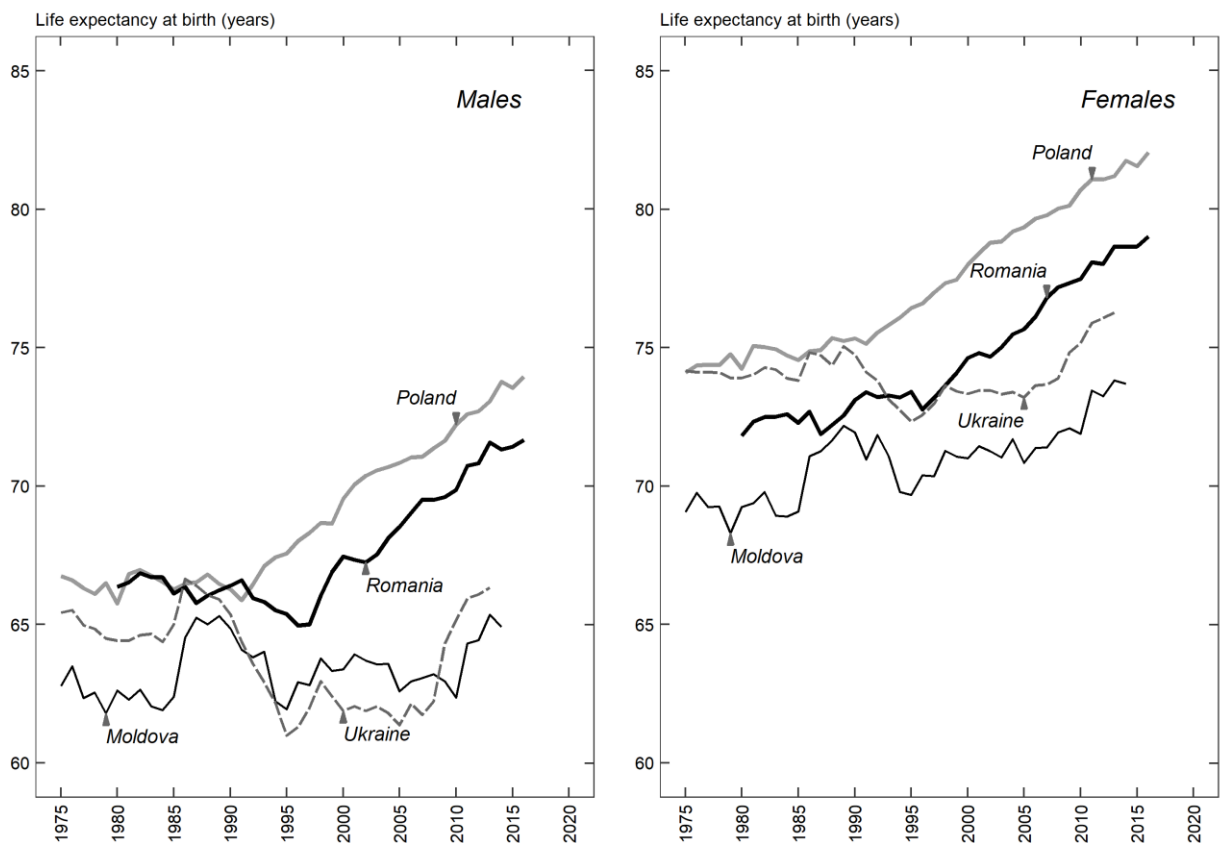


Figure 1. Sex-specific trends in life expectancy at birth in Romania, Poland, Moldova and Ukraine, by sex

*Figure 2* presents age- and cause-of-death contributions to Romanian life expectancy changes in two different periods: 1980-1996 (the period of deterioration) and 1996-2016 (the period of improvements). Adult males, especially around 40-64 years old, are the most affected age and sex group. Mortality growth at ages 25-69 years old would have reduced male life expectancy by 2.2 years if not to take into account the positive contributions in infancy and at older ages. Diseases of the circulatory system contributed the most to the overall decline in male life expectancy (-1.2 years), but visible negative changes are also characteristic of external causes of death, diseases of the digestive system and even infections. Infant mortality reduction for diseases of the respiratory system and other causes on the one hand and a very moderate

decline in old age mortality from respiratory diseases on the other hand are the unique positive contributions that occurred for both sexes between 1980 and 1996. Among adult females, mortality from all the main causes of death except for respiratory diseases mostly stagnated.

The largest share of the total health improvements in males (50%) and females (60%) between 1996 and 2016 are attributable to diseases of the circulatory system. Among females, cardiovascular mortality decline, especially at older ages, is more evident as compared to males (3.9 and 3.1 years out of the total gain equal to 6.3 and 6.7 years, respectively). In males, external causes of death are responsible for about 20% of the total life expectancy gain. Continuing progress in infant mortality (respiratory and other causes) contributed more than one year to the overall life expectancy growth. Other broad groups of causes of death except neoplasms at older ages have also played a positive role.

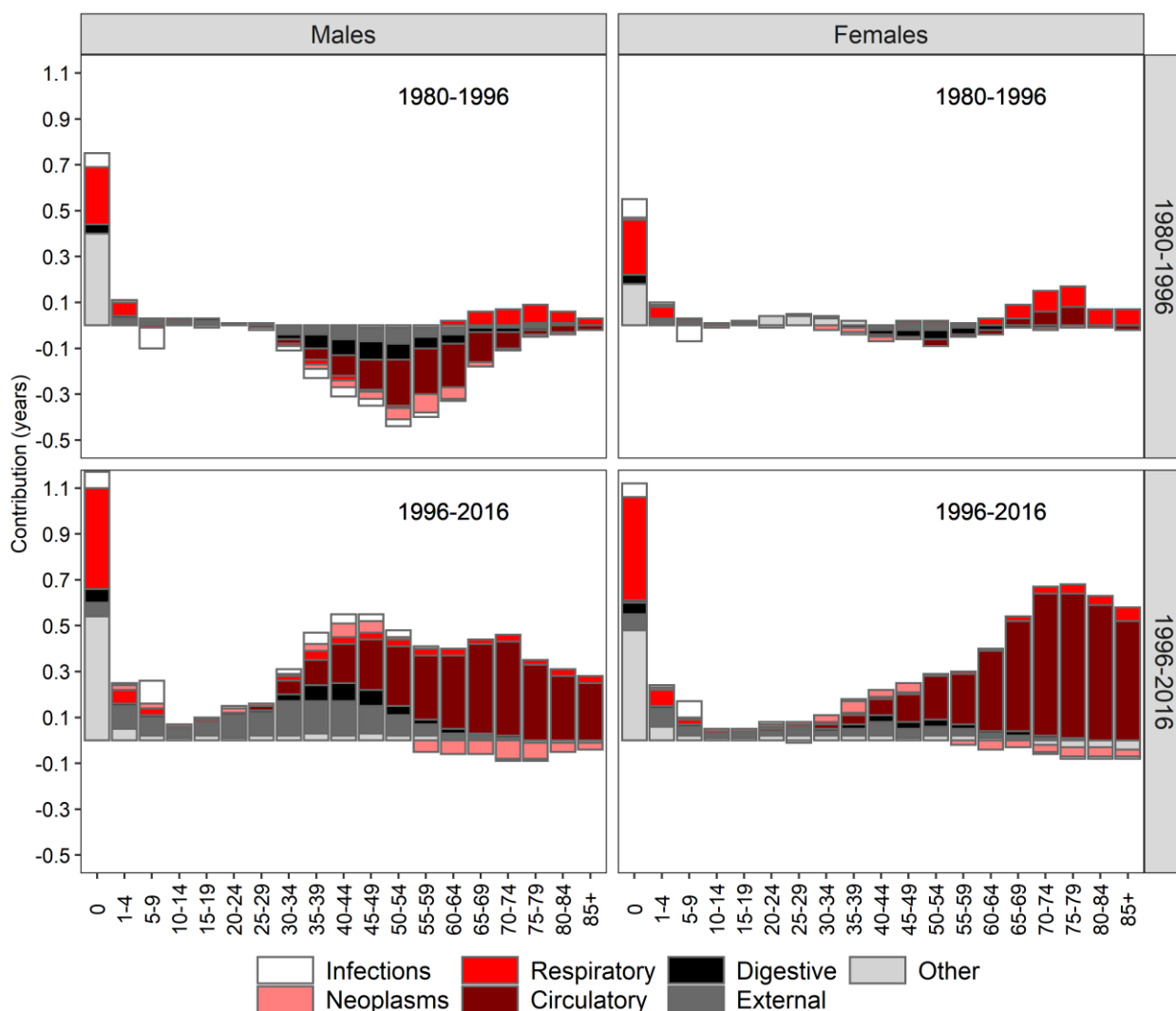


Figure 2. Age- and cause-of-death contributions to the changes in life expectancy at birth in Romania in 1980-1996 and 1996-2016, by sex

Figure 3 gives the primary information about the trends in standardized mortality rates for broad groups of causes of death. The period of health deterioration in Romania was characterized by mortality growth for all major groups of causes of death besides diseases of the respiratory system. In males, the mortality upsurge following immediately the 1989 revolution was somewhat more marked for circulatory diseases, diseases of the digestive system and infections. For violent causes of death, the absence of evident growth in the early 1990s for the whole group can be explained by the opposite trends observed for its subcategories (in particular, for suicide and homicide). The period of improvements after 1996 is mostly due to mortality decline for diseases of the circulatory system. At the same time, standardized mortality rates for cancer followed a stable growth throughout the whole period under study. This insensitivity of cancer mortality to the social and economic circumstances was already observed for other countries (Meslé et al., 1996 ; Meslé and Vallin, 2012). Finally, the very recent trends for certain groups of causes of death, like infections or respiratory diseases, disregarding the previous improvements are of particular concern and need further detailed analysis.

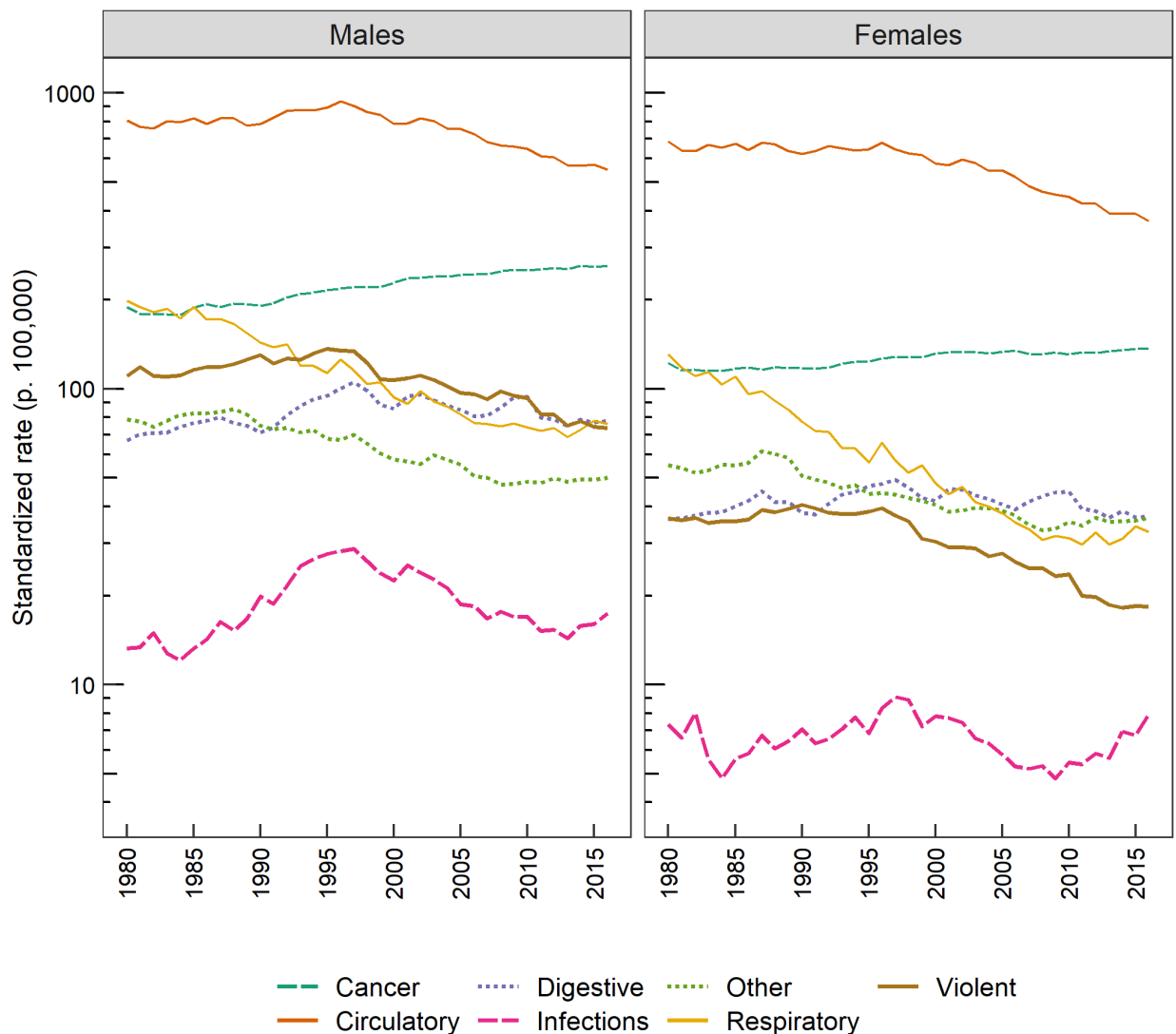


Figure 3. Annual trends in standardized death rates for 8 broad groups of causes in Romania. 1980-2016, by sex

A further analysis at a more detailed level of causes of death and by main age groups will provide clearer picture of the past and present epidemiologic situation in Romania in the context of the changing public health policies and health-related attitudes.

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