

## Forty-five years of cause-specific mortality trends in Moldova

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**Abstract.** Over the last forty-five years, Moldova failed to progress in life expectancy at birth. Disregarding the wide fluctuations linked to the 1985 anti-alcohol campaign and the social and economic crisis of the 1990s, the general trend in life expectancy is stagnating among males and slightly improving among females. Interpreting recent mortality changes in the light of long-term trends provides an insight into the reasons of the health crisis affected Moldova like other former USSR republics from the mid-1960s. However, the periodic changes in classification of causes of death break the continuity of death time series. To assure their consistency we used a special reconstruction method (Meslé and Vallin, INED). Moreover, unlike other European countries of the former USSR, the quality of death registration in Moldova in infancy and at older ages for the 1960s and 1970s is rather questionable. The analysis of cause-specific mortality trends will be produced here after corrections for under-registration. After a long period of deterioration mixed with large fluctuations as in other former USSR countries, the recent favorable trends give hope but not yet the proof of a start of sustainable positive trajectory.

### Introduction

Over the last forty-five years, Moldova failed to progress in life expectancy at birth. Disregarding the wide fluctuations linked to the 1985 anti-alcohol campaign and the social and economic crisis of the 1990s, the general trend in life expectancy is stagnating among males and slightly improving among females. Interpreting recent mortality changes in the light of long-term trends provides an insight into the reasons of the health crisis affected Moldova like other former USSR republics from the mid-1960s. However, the periodic changes in classification of causes of death break the continuity of death time series. To assure their consistency we used a special reconstruction method (Meslé and Vallin, 1996). Moreover, unlike other European countries of the former USSR, the quality of death registration in Moldova in infancy and at older ages for the 1960s and 1970s is rather questionable. The analysis of cause-specific mortality trends is produced after correction for under registration.

### Data and research methods

We analyse 1965-2012 continuous cause-of-death time series by sex and 5-year age groups reconstructed according to the abridged list of the 10<sup>th</sup> revision of the International Classification of Causes of Death (198 items).

Data are analysed after the correction of infant deaths substantially under-registered before the mid-1970s (Penina et al., 2010a) and mortality at older ages for the 1960s and 1970s (Penina et al., 2010b). Deaths from ill-defined causes of death such as "Senility without mentioning of psychosis" that dramatically increased in the 1990s were redistributed by a special method within the items of diseases of the circulatory system (Penina et al., 2010c).

We used the population counts for 1959-2012 calculated for Moldova in frame of the Human Mortality Database Project (<http://www.mortality.org/>).

The direct method of standardization and the method of decomposition proposed by Evgeny Andreev (1982) were used for data analysis.

## Main findings

The dynamics of life expectancy at birth in Moldova can be divided into three different periods (**figure 1**):

- 1) long-term mortality growth (1965-1984);
- 2) temporary wide fluctuations related to
  - a) launch of the anti-alcohol campaign (1984-1987) and its abandonment (1987-1991)
  - b) social and economic crisis (1991-1995) and the exit from it (1995-1998)
- 3) stagnation (for males) and slow improvement (for females) (from 1998).

The absence of the gains in life expectancy between 1965 and 2012 for males (-1.0 year) and a modest growth for females (+3.4 years) results from two contrasting trends: a decline in infant and child mortality on the one hand and an adult mortality rise on the other.

Both the global changes in life expectancy in 1965-2012 and its temporary fluctuations caused by the immediate circumstances of the 1980s and 1990s have been mostly driven by adult mortality changes from three major causes of death: circulatory diseases, diseases of the digestive system for both sexes and violent death for males. The decrease in infant and child mortality from infectious and respiratory diseases considerably checked the total losses of life expectancy at birth, especially before the mid-1980s (**figure 2**).

A continuous rise in adult mortality from the diseases typical for the third stage of the epidemiological transition as defined by Abdel Omran (cardiovascular and man-made diseases mainly), was responsible for **1965-1984** health deterioration. At the same time, this period was marked by the progress in mortality reduction for acute intestinal infections, tuberculosis, stomach cancer and some other diseases linked to the general sanitary improvement, vaccination, the spread of antibiotics etc.

The decline in infant mortality was not continuous in 1965-1984. In fact, the 1970s were marked by a short-term mortality peak, especially high for infectious diseases, which persists even after the correction for under-registration.

The most rapid mortality growth occurred for cirrhosis, especially among females. In 1965-1984 standardized mortality rates for that cause increased by four times among males and six times among females. Such an exceptionally high female mortality by cirrhosis is a particular feature of Moldovan mortality and the reason for which female health status is much worse in Moldova than in the other European countries of the former USSR.

An unprecedented life expectancy growth during the period of the anti-alcohol campaign (+3.27 years for males and +2.27 years for females in **1984-1987**) and a rapid reversion to the unfavorable trends once the restrictive measures have been slackened (-1.29 years for males and -0.46 years for females in **1987-1991**) revealed a high dependence of Moldovan mortality on excessive alcohol consumption and a very wide range of alcohol-dependent causes of death. Moreover, decomposition of male life expectancy gains in 1984-1987 and its losses in 1987-1991 shows the symmetric age and cause-of-death contributions.

After a considerable decline, from the late 1980s trends in mortality by infectious diseases, especially for tuberculosis, and respiratory diseases also reversed.

Mortality increase accelerated quickly in **1991-1995** once the social and economic crisis due to the sweep to market economy and to the USSR split hit the country. Mature adult males (35-64 years) were the most affected sex-and-age group. The post-crisis increase in life expectancy in **1995-1998** can be attributed to the population adaptation to the new social and economic circumstances, but is not the start of sustainable new positive new trends. This fact is confirmed by the symmetric age- and cause-specific components of the decrease in male life expectancy in 1991-1995 and its subsequent increase in 1995-1998 and a new upsurge in mortality among mature adults after 1998, particularly in males.

The life expectancy improvements in **1998-2012** (+0.86 years for males and +2.15 years for females) results from the decline of mortality from heart diseases among the older people and certain violent causes of death among young male adults. A more detailed analysis of heart diseases is complicated by recent gradual changes in coding practice that the reconstruction method cannot eliminate. Furthermore, while female life expectancy already caught up its 1970 maximum level (by more than 2 years), it is not yet the case for males; although, for both sexes the last two years are marked by an important jump in life expectancy. For males, almost identical levels of life expectancy in both 1965 and 2012 rely on quite different age-cause specific structures. Progresses at young ages and older ages are fully counterbalance by huge deterioration in middle ages, due to all major causes of death, including infections and respiratory diseases (**figure 3**).

It would take still several years before to be sure of sustainable progress, especially for males.

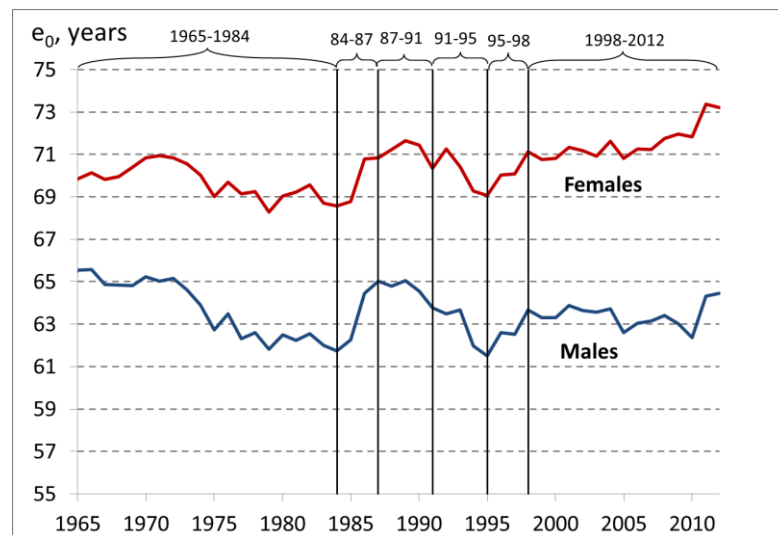


Figure 1. Evolution of life expectancy at birth in Moldova, 1965-2012

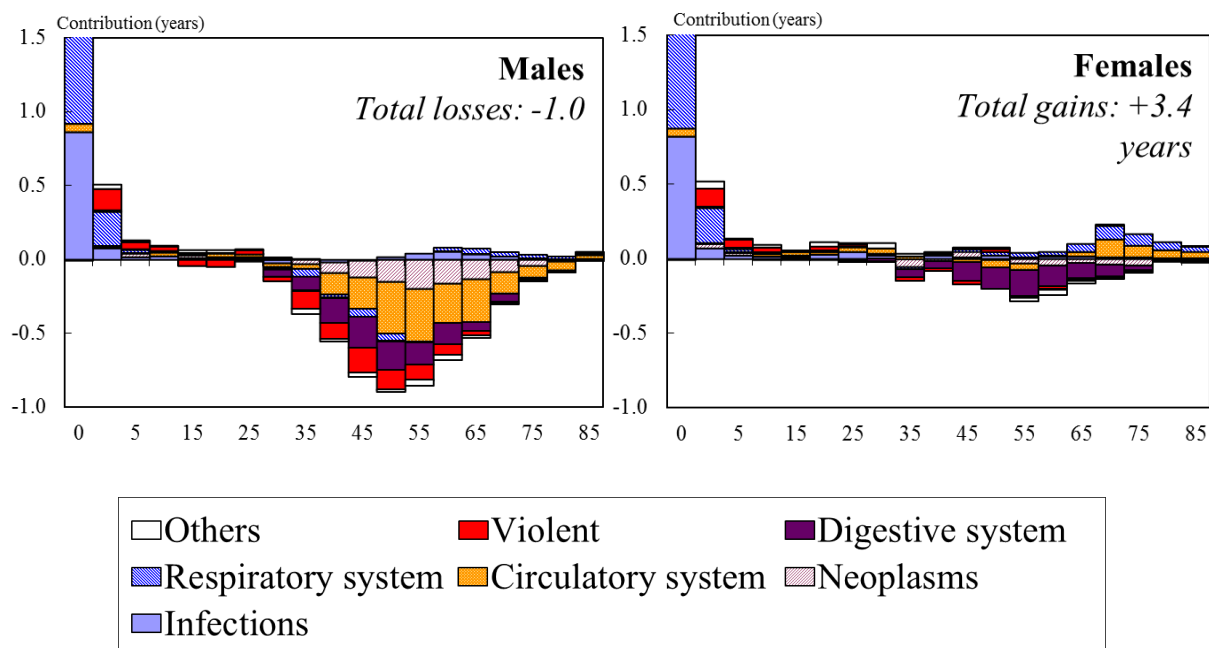


Figure 2. Age and cause of death contributions to the changes in life expectancy between 1965 and 2012 in Moldova

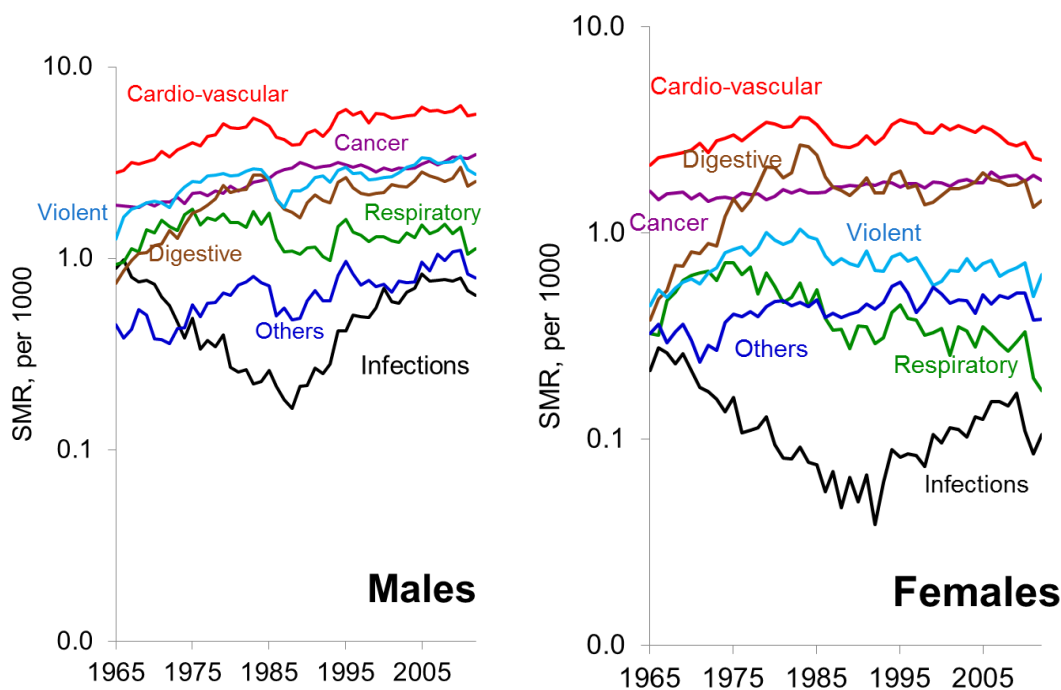


Figure 3. 1965-2012 trends in standardized mortality rates by major groups of causes at ages 35-64, by sex

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