The Impact of Avoidable Mortality on the Life Expectancy in Bulgarian Population

Assist. Prof. Dr. Mariana Mourgova, PhD

University of National and World Economy (UNWE), Sofia, Bulgaria

mmourgova@yahoo. com

Abstract

Mortality due to avoidable causes of death is one of the most often used quality and efficiency indicators for the health care system and the policies of prevention of morbidity and mortality by causes of death due to behavioural or environmental factors. The objective of the article is to study the impact of avoidable mortality including amenable and preventable mortality on the life expectancy in Bulgaria during the period 2005-2012. The classification of avoidable mortality, proposed by the Office for National Statistics of the United Kingdom in 2011, is used. The methods of decomposing the change in two life expectancies by age and the change in two life expectancies by age according to the causes of death by E. Andreev and E. Arriaga are applied to measure the impact on the change in life expectancy. The main results of the study show that during the period 2005-2012 along with the decrease in the total mortality, also the avoidable mortality has dropped – from 34. 72% to 29. 12% of the mortality due to all causes of death. The avoidable causes' of death contribution to life expectancy increase is by 1. 20 years and it is considerably greater than those of the other causes. Mortality due to amenable and preventable causes of death is also decreasing. Greater is the effect of the amenable causes of death on the life expectancy increase.

Keywords: life expectancy, avoidable mortality, amenable mortality, preventable mortality

Introduction

Avoidable mortality is a major public health concern (Wheller, L. *et al.,* 2007). The concept of avoidable mortality was introduced by Rutstein *et al.* in 1976 in order the healthcare system's quality and efficiency to be assessed and its weaknesses to be identified (Rutstein *et al.,* 1976).

In the last decades the classification related to avoidable causes of death is developed and complemented as a result of the development of science and medicine. Some of the most often used classifications are those proposed by Nolte and McKee (2003), Page *et al*. (2006), and Office for National Statistics (ONS), UK (2011).

According to the ONS definition, avoidable mortality designates deaths from particular conditions, at certain ages, as ones that should not occur in the presence of timely and effective health care or other appropriate interventions (ONS, 2011). Avoidable mortality includes amenable and preventable mortality. Amenable mortality according to Nolte & McKee (2003) is mortality by causes that could have been avoided by means of medicine and are subject to medical interventions. Page *et al.* (2006) define "preventable" mortality as death by causes that could be prevented through policies of prevention of death and morbidity by certain causes, including change of the individual behavior and such that could limit the adverse environmental effect.

Mortality from avoidable causes of death in Bulgaria has not been well enough studied yet. Small number of publications on the topic exists, where avoidable mortality is studied in view of making an assessment of the healthcare system's efficiency and quality and the prevention policies of morbidity and mortality by preventable deaths (M. Mourgova, 2016) and the differences by sex in the avoidable mortality among the old age population in Bulgaria (M. Mourgova, 2016).

In this article the impact of the avoidable, amenable and preventable mortality on the the change in life expectancy in Bulgaria during the period 2005-2012 is measured. Appling the method of life expectancy decomposition, the contribution of mortality by age due to those causes to the total change in the life expectancy is assessed.

Research method

In our study we used data of the World Health Organization by age and cause of death in Bulgaria according to the Tenth Revision of the International Classification of Diseases (ICD-10).

For the purpose of studying the mortality by avoidable, amenable and preventable causes of death, the classification proposed by the ONS (2011) is used.

To decompose the changes in life expectancy and the changes in life expectancy by causes of death, methods proposed independently one of the other by Andreev (1982) and Arriaga (1984, 1989) are applied.

Results and discussion

During the period 2005-2012 the life expectancy in Bulgaria was increased from 72. 52 to 74. 19 years or by 1. 67 years. The total increase is due to the increase in life expectancy at all ages, except only for the ages from 1 to 4 and from 15 to 19 (Fig. 1), where the mortality increased. The highest increase is observed in the age up to 1 year and in the ages between 65 and 80 years.

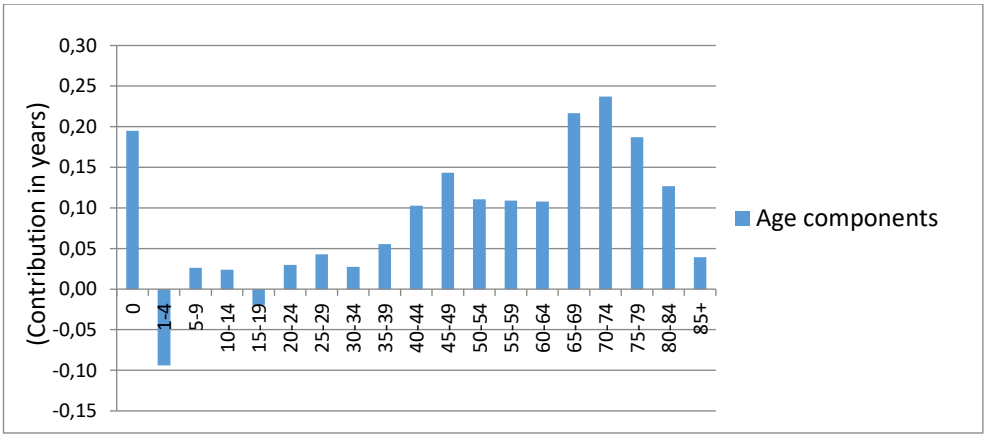

Fig. 1. Age-specific contribution of mortality to the change in life expectancy at birth in Bulgaria during the period 2005-2012

The proportion of avoidable causes of death in the total mortality decreased from 34. 72% in 2005 to 29. 12% in 2012 (Fig. 2). Mortality from the amenable deaths is higher than that of the preventable deaths (Fig. 3). During the period 2005-2012 the proportion of amenable deaths decreased from 24. 41% to 19. 25%, and that of preventable deaths decreased from 19. 67% to 15. 80%.

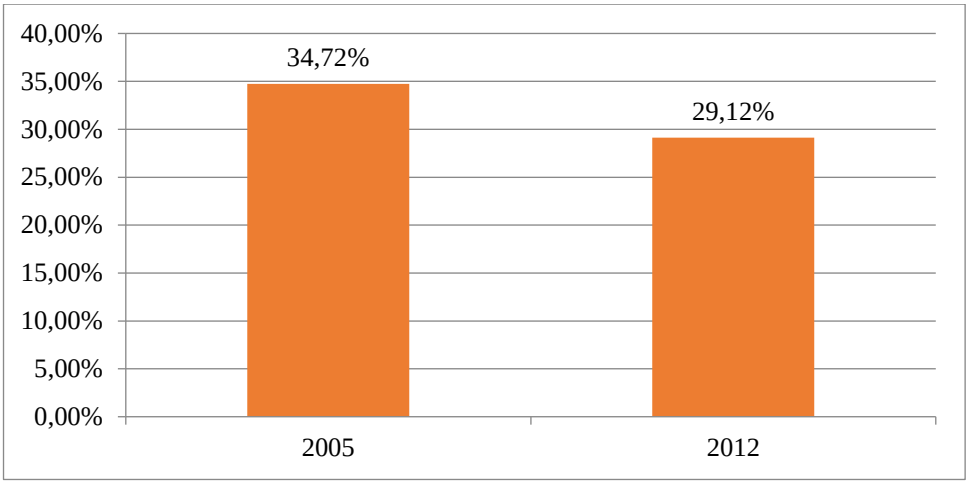

Fig.. 2. Proportion of the avoidable causes of death to the total number of deaths in Bulgaria during the period 2005-2012

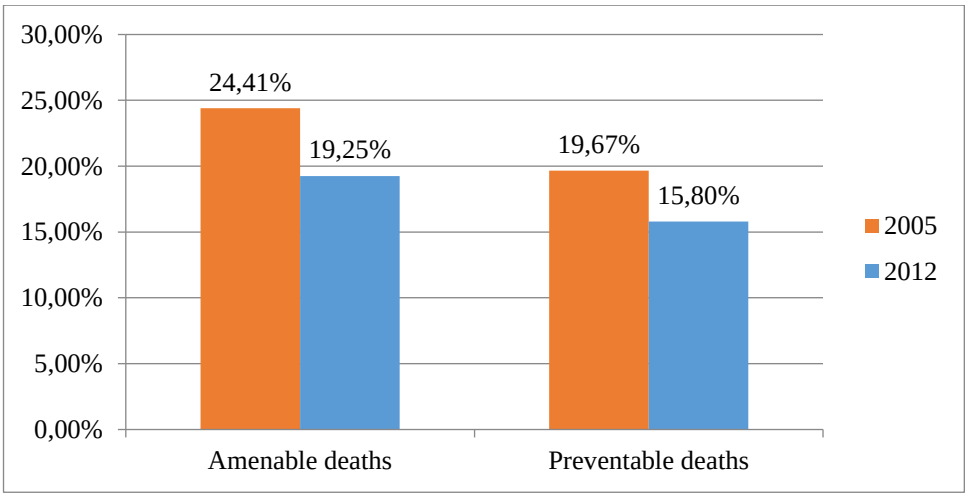

Fig. 3. Proportion of the amenable and preventable causes of death to the total number of deaths in Bulgaria during the period 2005-2012

The decomposition of life expectancies in Bulgaria by age and by avoidable and other causes of death is shown on Fig. 4. The total increase in the life expectancy of 1. 67 years is due mainly to the decrease of the avoidable mortality. Its contribution to the total increase in life expectancy by those causes is 1. 20 years, and by those of the other causes is 0. 47 years.

The decrease in mortality by avoidable causes of death is observed at all ages, except for those of 15 and 19 years. The biggest contribution to the life expectancies has the decrease in the avoidable mortality at ages up to 1 year and the ages between 65 and 75 years. Substantial is also the contribution in the ages between 40 and 60. The mortality by other causes, which could not have been avoided, also contributed to the increase in the life expectancy. Most substantial is their contribution at the ages from 1 year, between 60 and 65 years and over 70 years. The contribution of the unavoidable causes of death at the ages between 1 and 4 years and between 65 and 69 years is negative, which is due to the increase in mortality by those causes.

Fig. 4. Age-specific contribution of avoidable and other causes of death to the change in life expectancy at birth in Bulgaria during the period 2005-2012

The decomposition of life expectancy changes due to amenable and preventable causes of death shows that the decrease in mortality by amenable causes of death has greater contribution to the increase in life expectancy - by 0. 94 years (Fig. 5.). This contribution is greatest at the ages up to 1 year and between 65 and 75 years. Substantial also is the decrease in mortality by those causes at the ages between 40 and 60 years.

The decrease in mortality by preventable causes of death contributes to the increase in the life expectancy by 0. 73 years. Their contribution is greatest at the ages between 65 and 75 years, 45 and 60 years, and up to 1 year, whereas the contribution at the ages between 15 and 19 years and between 60 and 64 years is negative.

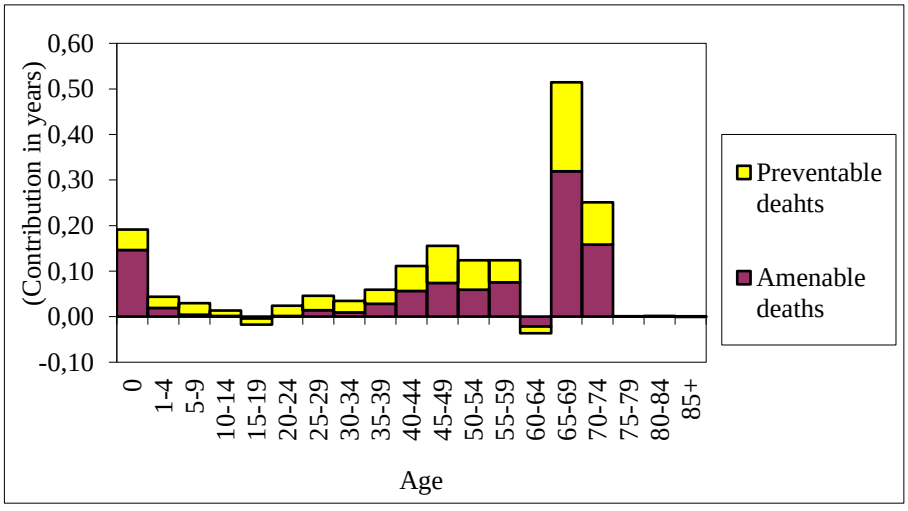

Fig. 5. Age-specific contribution of amenable and preventable causes of death to the change in life expectancy at birth in Bulgaria during the period 2005-2012

In conclusion, the results of the study show that with the increase of the total mortality in Bulgaria, also the mortality by avoidable causes of death decreases, and their contribution to the change in life expectancy increase is substantially greater compared to the other causes of death.

The greater effect of the amenable mortality on the life expectancy increase is an indicator of improvement in the quality and efficiency of the healthcare system. The decrease in mortality by preventable causes of death shows decrease also in the mortality by causes related to the individual behavior and the environmental effect.

Notwithstanding this positive trend, avoidable mortality in Bulgaria exceeds 29% of all causes of death. This relatively high proportion indicates the necessity of a policy of further decrease in mortality by those causes of death through improvement of the health services and prevention of morbidity and mortality by causes, which are related to behavioural factors, such us unhealthy nutrition, overweight, smoking, alcohol consumption and drugs (narcotic substances), and immunizations.

References

[1] Andreev, E. (1982). Method component v analize prodoljitelnosty zjizni. [The method of components in the analysis of length of life]. Vestnik Statistiki, 9, 42-74

[2] Arriaga, E. (1984). Measuring and explaining the change in life expectancies. Demography, 21(1), 83-96

[3] Arriaga, E. (1989). Changing trends in mortality decline during the last decades. In: Ruzicka, L. et al. (eds.). Differential mortality: Methodological Issues and Biosocial Factors. Oxford, Clarendon Press, International studies in demography, 105-129

[4] Mourgova, M. (2016). Is effective the health care in Bulgaria. Naselenie, Vol. 1, Bularian Academy of Scienses (in press, in Bulgarian)

[5] Mourgova, M. (2016). Sex differentials in old age mortality in Bilgaria by causes of death that could be avoided. In: Series B. Natural sciences and the humanities, Vol. XVII. Plovdiv: Union of Scientists in Bulgaria (in press, in Bulgarian)

[6] Nolte, E. & McKee, M. Does health care saves lives? Avoidable mortality revisited. (2003). London: The Nuffield Trust

[7] Office for National Statistics. (2011). Definitions of avoidable mortality. Consultation, February

[8] Page, A., Tobias, M., Glover, J., Wright, C., Hetzel, D., & Fisher, E. (2006). Australian and New Zealand Atlas of Avoidable Mortality. University of Adelaide. Adelaide: PHIDU.

[9] Rutstein, D. D., Berenberg, W., Chalmers, T. C., Child, C. G., Fishman, A. P., Perrin, E. B., Feldman, J. J., Leaverton, P. E., Lane, M. J., Sencer, D. J., & Evans, C. C. (1976). Measuring the Quality of Medical Care: A Clinical Method. New England Journal of Medicine, 294, 582-588.

[10] Wheller, L., Baker, A., Griffiths, C., & Roony, C. Trends in avoidable mortality in England and Wales, 1993-2005. (2007). Health Statistics Quarterly. Office of National Statistics, Summer