

# DYNAMICS OF AVOIDABLE DEATHS IN ROMANIA BETWEEN 2006 AND 2013

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**Keywords:** avoidable death, preventable and treatable causes, Romania, health status

**Abstract:** Population's health status assessment is quite difficult, especially due to its multi-determinism. One of the indicators of health status assessment is avoidable death caused by diseases that are "preventable" (primary prevention) and "treatable" (secondary prevention) as specific indicators of the efficiency/inefficiency of health systems. European studies on avoidable mortality show that Romania ranks first in the European Union, regarding both genders. In order to highlight the dynamics of avoidable deaths in Romania, we analysed in this study all deaths which fall within this concept, recorded during 2006-2013. To establish the criteria for inclusion in the study, the list of Leveque et al. was used. Both categories of avoidable deaths, amenable to health care, respectively to health policies have recorded a downward trend, but with a greater reduction in percentage for those determined by conditions responding to healthcare. The study of the dynamics of avoidable deaths allows making comparisons nationally and internationally with a view to identify areas with a high incidence of this phenomenon, as well as the disparities between those areas, the ultimate goal being to identify root causes and to remove/mitigate them. Optimizing the health system in Romania would positively contribute to improve these figures and to a better ranking among EU countries.

## INTRODUCTION

Health, along with other social, economic, cultural, educational etc. aspects defines the concept of "quality of life". In 1946, the World Health Organization defined health as "state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.(1)

There is no protocol for quantifying the health status of an individual in particular, respectively of a population in general, because of the multitude of factors that can influence it and that are acting synergistically: biological factors, lifestyle of the individual, social networks and general environment conditions, socio-economic and cultural aspects. Achieving the standards in terms of health does not depend exclusively on health systems and their performance but also on the individual and the society itself.(2)

Currently, health systems have an increasingly more positive influence on the level of overall mortality, which in fact, is influenced by many other factors. The limits of the beneficial influences of health systems are particularly manifested at the level of some types of cancer, which exclusively benefit from palliative treatment.(3) To overcome those limitations, there was introduced and perfected the concept of avoidable mortality that is attributable to healthcare services. This entity was originally introduced and defined in 1976 in the US by Rutstein, as a way of identifying and quantifying the failure of the health system.(4) According to the theory presented, at least theoretically, given early and effective healthcare, deaths could be avoided. Achieving this goal requires clear identification of the conditions in which healthcare can prolong survival and may avoid death.

Avoidable deaths, as shown in the literature, are deaths before the age of 65, which can be influenced by

curative and preventive methods (healthcare and preventive measures).

The basic concept resulting from analysing avoidable mortality is that deaths from certain conditions for which effective public health interventions are available, should be rare or, ideally, should not occur.(5) Specifically, avoidable mortality combines standardized mortality rates for a range of diseases on which it is estimated that healthcare has a direct impact. The usefulness of this concept also derives from its use for comparisons at national and international level in order to identify areas with a high incidence of the phenomenon of avoidable mortality, as well as the inequities between those areas, the ultimate goal being to identify the root causes and to remove/mitigate them.(6,7)

Depending on the type of disease leading to death, avoidable mortality is classified as follows:

- *treatable mortality caused by treatable diseases* (disease amenable to secondary prevention) - causes of death from these illnesses could be prevented by therapeutic means or by means of secondary prevention (e.g. hypertension, colon cancer, gastric ulcer, leukemia, respiratory diseases, asthma, gallstones, maternal mortality etc.);
- *mortality caused by preventable diseases* (diseases amenable to primary prevention) - refers to disorders that could be avoided through public health policies (prevention interventions, health promotion), thus avoiding the occurrence of disease (cirrhosis, road events, ischemic heart disease, lung cancer).

From the literature and studies in this field, nationally and internationally, we note the following significant epidemiological data:

- Multiple studies over the period 2001-2010 constantly

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Article received on 01.02.2016 and accepted for publication on 02.03.2016  
ACTA MEDICA TRANSILVANICA March 2016;21(1):1-4

demonstrated high rates of avoidable mortality in the United States;(8) higher incidence of avoidable deaths in men - 83.7 per 100.000 population compared to females - 39.6 per 100.000 population; the main cause of avoidable mortality in the US is represented by cardiovascular disease, accounting for about 30% of overall annual mortality (about 800.000 deaths/year);

- At European level, well developed countries, such as France, Germany and the United Kingdom have overtaken the US in terms of avoidable death rate and the pace of improvement of this indicator; so between 1999 and 2007, the rate of deaths that could have been avoided decreased by 18.5% for men in the US, while in the UK, this was reduced by almost 37%; for women, the rate fell by 17.5% in the US and by almost 32% in the UK;(9)
- Independently of the period taken into consideration, of the classification chosen, Romania ranks last places in terms of health system performance; the trend of our country regarding this issue is downward, so the European Index of Health (ECHI) for 2014 ranked Romania 25<sup>th</sup> of 31 countries; Romania ranked 27<sup>th</sup> in 2015;(10)
- Studies conducted on avoidable mortality shows that Romania ranks first in EU regarding both genders, and compared to other countries where the trend in this area is significantly low, in Romania this trend is either reduced for women or it is stationary in men;(11)
- A study conducted in Romania on avoidable deaths recorded in 2007 and 2012 (12) found in both genders a decrease in avoidable mortality in Romania in 2012 compared with 2007, but still in lower percentages; It was found a higher rate of deaths avoidable through primary prevention in men and in women, a significant incidence of avoidable deaths through secondary prevention.

**PURPOSE**

Since European statistics have shown an increased incidence of avoidable deaths in Romania, which ranks it first in terms of assessing this public health indicator, we consider it appropriate and useful to study the dynamics of this phenomenon.

Through this study, we aimed at highlighting the trend of avoidable deaths in the period under study, the most common causes of avoidable deaths and at comparing the deaths caused by “treatable” diseases and “preventable” diseases.

**MATERIALS AND METHODS**

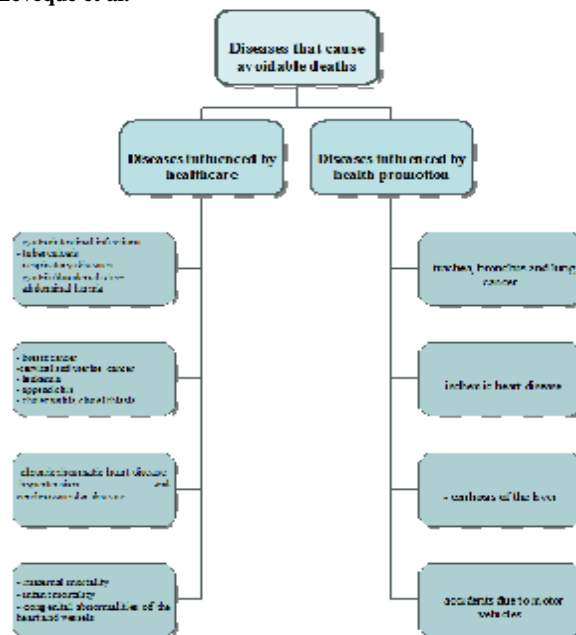
*Data source* – for highlighting and prioritizing deaths which fall within the concept of avoidable death, we used the database on mortality of the National Institute of Statistics of Romania (13) and the Health Statistical Yearbook for 2014 (14) (there are denoted deaths nationally, on causes, gender and age group).

*The period under study* - to highlight the dynamics of avoidable deaths in Romania, there have been analyzed all deaths that fell within this concept during 2006-2013 (2013 is the last year for which statistics were available at the time of the study).

*The list of causes determined by avoidable deaths* - was chosen as the model for determining the criteria for inclusion in the study, the list used being that of Leveque et al. in a study conducted in Belgium, between 1985 and 1989 (figure no. 1); the list observes the classification of avoidable deaths, depending on determining conditions, in two categories - treatable diseases (amenable to healthcare) and

preventable disease (disease amenable to health promotion).

**Figure no. 1. The list of causes of avoidable deaths used by Levêque et al.**



**RESULTS**

In table no. 1, we presented the absolute numbers of avoidable deaths in Romania, during 2006-2013, according to gender and inclusion in one of two categories - deaths caused by “treatable” diseases (secondary prevention) and deaths caused “preventable” diseases (primary prevention).

**Table no. 1. The absolute numbers of avoidable deaths in Romania, 2006-2013, per gender and determining conditions**

Year	Treatable diseases			Preventable diseases		
	Men	Women	Total	Men	Women	Total
2006	9166	8045	17211	16975	5307	22282
2007	8479	8164	16695	16373	5615	21988
2008	8796	7831	16631	16096	5495	21591
2009	8457	7300	15765	15896	5366	21262
2010	7965	7081	15045	16341	4840	21181
2011	7636	7065	14701	15975	4823	20798
2012	7325	6688	14013	15542	5151	20693
2013	7221	6353	13574	15525	4866	20391
<b>Total</b>	<b>65045</b>	<b>58527</b>	<b>123572</b>	<b>128723</b>	<b>41463</b>	<b>170186</b>

By figure no. 2, we revealed the largest share of avoidable deaths responding to primary prevention and by figure no. 3, the higher incidence of avoidable deaths in men, both for preventable and for treatable diseases, with a greater difference between genders in the first category (for avoidable deaths caused by preventable diseases, 75.64% was registered in men, and in the case of avoidable deaths due to treatable diseases, 52.64% were registered in men).

**Figure no. 2. Primary/Secondary prevention**

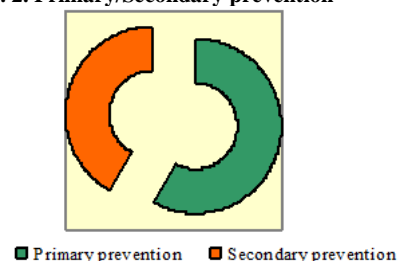
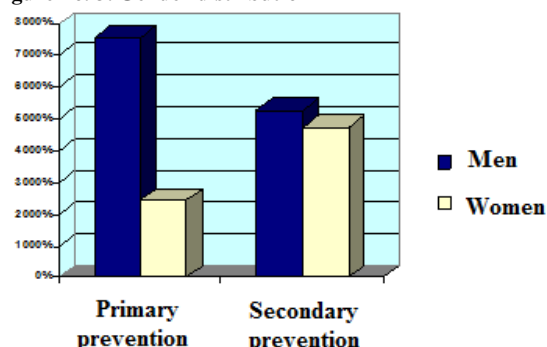
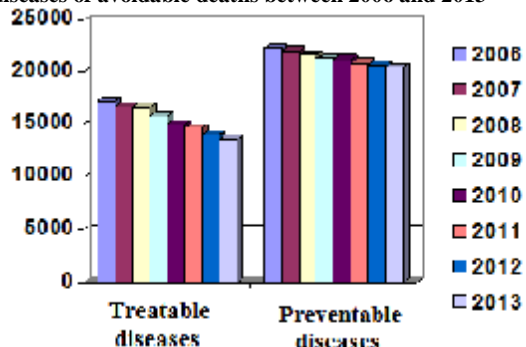


Figure no. 3. Gender distribution



Analyzing the dynamics of avoidable deaths (figure no. 4) in the period under study, according to two categories, we found a net downward trend - for diseases responding to primary prevention (decrease of 1 891 deaths from a total of 22 282 deaths in 2006 to a total of 20 391 in 2012) and for those responding to secondary prevention (a decrease by 3 637 deaths from a total of 17 211 in 2006 to a total of 13 574 in 2012). Thus, the number of avoidable deaths due to treatable diseases was reduced by 20% in 2013 as against 2006, compared with a reduction of only 9% in the case of preventable deaths.

Figure no. 4. Repartition of treatable and preventable diseases of avoidable deaths between 2006 and 2013



Next (table no. 2), we presented the absolute values of avoidable deaths recorded in Romania, according to the determinants of avoidable deaths in two significant moments, respectively in the first and the last year under study, respectively 2006 and 2013. Analyzing the above-mentioned dates, we found the following, in terms of the evolution in time of the causes of avoidable deaths:

- decrease of the incidence of tuberculosis in determining causes of avoidable deaths was about 40% in both sexes (decrease by 39.92% in men and 41.67% in women);
- emergence of a new disease which causes avoidable death in men - breast cancer (in 2006, there has been no such cases, and in 2013, there were reported 22 cases); moreover, in women, there has been a decrease by only 5.5%;
- avoidable deaths caused by cancer of the trachea, bronchi and lungs have recorded significant increases in 2013 compared to 2006 (in men from 3 676 cases to 4013 and for women from 483 to 885 cases); for women, deaths caused by trachea, bronchi and lung cancer nearly doubled in 2013 compared with 2006 (figure no. 5);
- regarding ischemic heart diseases as causes of avoidable deaths, these have also recorded decreases in evolution, in

both sexes, but more important in women, in whom there was a decrease of 21% compared to 14% in men (figure no. 6).

- for leukemias, chronic rheumatic heart disease, hypertension and cerebrovascular disease, decreases in 2006 compared to 2013 were approximately equal in women and men.

Table no. 2. Causes of avoidable deaths in Romania, in 2006 and 2007

Disease	2006		2013	
	Men	Women	Men	Women
<b>“Treatable” diseases</b>				
Gastrointestinal infections	13	19	7	6
	32		13	
Tuberculosis	1220	192	738	112
	1412		850	
Breast cancer	-	1510	22	1426
	1510		1448	
Cervix and uterine cancer	-	1518	-	1129
	1518		1129	
Leukaemias	27	22	17	13
	49		30	
Chronic rheumatic heart disease	26	5	13	3
	31		16	
Hypertension and cerebrovascular disease	6001	3260	5139	2763
	9261		7902	
Respiratory diseases	110	91	101	56
	201		157	
Gastric and duodenal ulcer	187	42	99	19
	229		118	
Appendicitis	10	7	4	1
	17		5	
Abdominal hernias and bowel obstructions	106	66	65	50
	172		115	
Maternal mortality	-	38	-	20
	38		20	
Congenital abnormalities of the heart and vessels	44	50	31	27
	94		58	
Infant mortality	1422	1225	985	728
	2647		1713	
<b>Total treatable diseases</b>	<b>9166</b>	<b>8045</b>	<b>7221</b>	<b>6353</b>
	17211		13574	
<b>“Preventable” diseases”</b>				
Cancer of the trachea, bronchus and lung	3676	483	4013	885
	4159		4898	
Ischemic heart diseases	7502	2497	6400	1986
	9999		8368	
Cirrhosis	3902	1806	3541	1667
	5708		5208	
Accidents involving motor vehicles	1895	521	1571	328
	2411		1899	
<b>Total preventable diseases</b>	<b>16975</b>	<b>5307</b>	<b>15525</b>	<b>4866</b>
	22282		20391	
<b>Total avoidable deaths</b>	<b>26141</b>	<b>13352</b>	<b>22746</b>	<b>11219</b>
	39493		33965	

Figure no. 5. Avoidable deaths per gender caused by cancer of trachea, bronchus and lung, 2006 and 2013

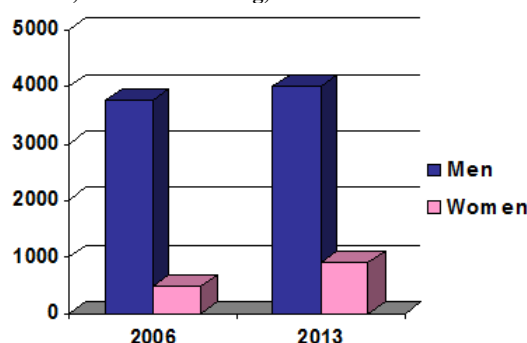
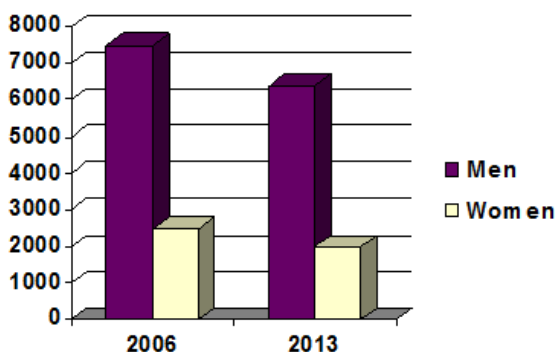


Figure no. 6. Avoidable deaths per gender caused by ischemic heart diseases, 2006 and 2013



### DISCUSSIONS

The study on the dynamics of avoidable deaths conducted during 2006-2013 revealed a highly superior incidence in men, as well as a larger percentage of avoidable deaths amenable to primary prevention. There has also been found a net downward trend in the case of avoidable deaths amenable to primary prevention, as well as of those amenable to secondary prevention.

This downward trend observed in evolution, demonstrates a positive influence on the health of population of health policy (primary prevention) and of more efficient healthcare (secondary prevention), representing actually an increased quality of healthcare.

Studies in this area are mainly prophylactic by the possibility to identify the main causes of avoidable deaths, which subsequently should contribute to the development of health policies tailored to needs, but also to increase the performance of health care system.

### CONCLUSIONS

- Quantification and ranking of avoidable deaths is an effective method for measuring the health of the population, as well as for assessing the effectiveness/ineffectiveness of health systems.
- Study of the dynamics of avoidable deaths allows making comparisons nationally and internationally, with a view to identify areas with a high incidence of this phenomenon and the inequities between those areas, the ultimate goal being to identify the root causes and to remove/mitigate them.
- Avoidable deaths are more common in men, with a higher percentage for those caused by preventable diseases.
- Related to the list of diseases that cause avoidable deaths used by Leveque et al., during the entire studied period, there has been noticed a higher number of avoidable deaths determined by conditions amenable to primary prevention (preventable diseases).
- Both categories of avoidable deaths have registered a decreasing trend, but with a greater reduction in percentage for those determined by conditions amenable to secondary prevention.
- Avoidable deaths caused by cancer of the trachea, bronchi and lungs have risen significantly in 2013 compared to 2006, reported in both genders; in case of women they doubled.
- Ischemic heart diseases as causes of avoidable deaths have registered decreases in absolute figures, especially in women.

- Rendering more efficient the health system in Romania would contribute positively to improving these figures and to a better ranking of Romania among EU countries.

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