Cancer Mortality, Recent Trends And Perspectives

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Abstract

Considering that a register for cancer was established in Federation of Bosnia and Herzegovina only recently, basic reliable source for the analysis of cancer mortality trends are the data on death cases caused by such diseases. Lack of census as well as standardized mortality rate data makes the study even more difficult to make. The aim of the study is the analysis of the malign diseases trend in the post-war period according to the available data. The study is the descriptive work on the analysis of the system using linear regression methods for expected trend for the total population and age group from 0 to 64 years. Registered rate of cancer mortality in Federation of Bosnia and Herzegovina in 2004 was 142 per 100000 inhabitants, and indicates input stream in the analyzed period. Total increase in mortality of males and females is 2,5% per year. It is expected that in 2020 around 5000 inhabitants of Federation of Bosnia and Herzegovina will die of some malign disease. Trend of mortality of malign diseases in males is higher than in females and more probable in older population. There is a tendency of mortality decrease in the group of 0-64 years of age. Mortality list of the most frequent locations of cancer has undergone changes. Liver cancer, colon cancer, sigma and rectum cancer as well as lung and breast cancer lead the list. Objective ageing of the population, technological drawbacks, insufficient primary and secondary prevention worsened by socio-economic life conditions will affect the increase in number of people with malign diseases in Bosnia and Herzegovina.

KEY WORDS: cancer, mortality, trend

Introduction

In certain European countries differences exist in mortality of malign diseases. Trend of mortality of cancer (for the most frequent cases), that was increasing in Europe since 1990, starts to drop slightly (1). In the countries of Eastern and Central Europe number of males who died of lung cancer increased by 10% after 1990. Simultaneously, number of females who died of breast cancer increased by 10% and those who died of cervix cancer by 20%. Existence of potential causes of cancer, such as smoking, alcohol, eating habits, pollution of environment along with inadequate screening, diagnosis and treatment affects locations of the most frequent tumors and their trend (2). Most of EU countries have registers for cancer and standardized population on the basis of which they obtain reliable data on mortality trend for quite a long period of time (3). However, the number of the deceased in the register for cancer is frequently lower than the number stated in the official statistics. The explanations may lie in the incomplete registration of the diagnosed cases (respect of patients' rights), lack of linkage of the health system (residence certificate, treatment certificate) and insufficient data provided by health institutions. In Bosnia and Herzegovina, trends level of malign diseases should be the only reliable indices of mortality of these diseases. Last census was carried out in 1991, migration process is not completed. Register for cancer has just been established and includes the data at entity level (not the state level). Mortality data have just recently been processed at the state level.

Objective

The aim of the study is the analysis of the trend of malign diseases in the post-war period according to the available data.

Material and Methods

Descriptive study of the system analysis was done using linear regression for the expected trend for total population and age group from 0-64 years. The study encompasses the period from 1999-2004. Trend level was observed with respect to the total mortality, according to sex, age, location of the disease. Data source are frequencies of the deceased in the six-year period in Federation of Bosnia and Herzegovina (Institute of Statistics FB&H).

Results

Cancer caused mortality rate (non-standardized) was slightly increasing by 2,5% per year, whereas for the age group of 0-64 years that increase was 0,5%. Percentage of the deceased in the age group 0-64 years compared to the total number of the deceased decreased from 49,1 to 40,5% (Table 1). Standardized rate of general mortality for 2004 was 140,14 per 100000 inhabitants and is lower than the non-standardized one (142,12/100000). General mortality rate for males in 2003 was 173,7 and for females 109,9. In the period 1998-2004, in the group of males of age 0-64 years, mortality rate ranged between 77,3 and 86, and in the group of females between

	1999.	2000.	2001.	2002.	2003.	2004.
total number of the deceased	2655	2969	3042	3178	3257	3304
mortality rate /100 000	115,54	129,78	131,83	137,26	140,32	142,12
number of the deceased 0-64 years of age	1303	1374	1348	1381	1383	1339
Mortality rate in age group 0-64 years/100 000	63,35	67,15	68,65	67,07	67,02	65,04
% of the deceased in age group 0- 64 years of the total number of the deceased	49,1	46,3	44,3	43,4	42,5	40,5

TABLE 1. Malign diseases caused mortality rate in Federation of Bosnia and Herzegovina according to the year

	1999.	2000.	2001.	2002.	2003.	2004.
number of the deceased 0-64 years of age	1303	1374	1348	1381	1383	1339
mortality rate 0- 64 years/100 000	63,35	67,15	68,65	67,07	67,02	65,04
number of the deceased males 0-64 years of age	766	823	862	811	809	849
male mortality rate 0-64 years/100 000	77,3	83,1	87	81,9	81,9	86,0
number of the deceased females 0-64 years of age	537	551	486	570	574	443
female mortality rate 0-64 years/100 000	50,3	51,6	45,5	53,3	53,6	41,3
% of the deceased males 0- 64 years of age of the total number of the deceased in 0-64 years group	58,8	59,9	63,9	58,7	58,5	63,4
% of the deceased females 0- 64 years of age of the total number of the deceased in 0-64 years group	41,2	40,1	36,1	41,3	41,5	36,6

TABLE 2. Malign diseases caused mortality rate in Federation of Bosnia and Herzegovina according to sex and age

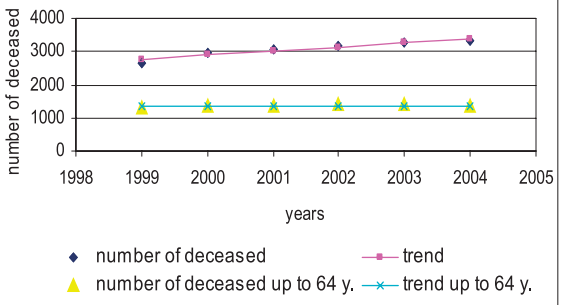

CHART 1. Cancer mortality trends for all ages and age group 0-64 years
Y= 2958,7+ 43,5x (for the deceased of all ages)
Y= 1348,51+2,46x (for the deceased 0-64 years of age)

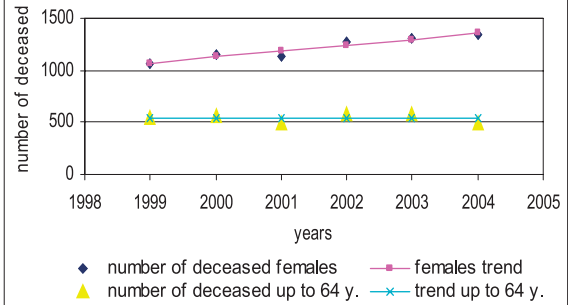

CHART 3. Female cancer mortality trends for all ages and age between 0 and 64 years
Y= 1161,4 + 20,57x (for the deceased females of all ages)
Y= 536,77- 0,84x (for the deceased females 0-64 years of age)

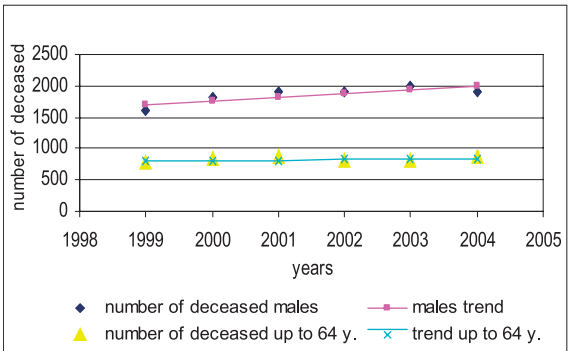

CHART 2. Male cancer mortality trends for all ages and age group 0-64 years
Y= 1799,7+22x (for the deceased males of all ages)
Y= 811,74+3,3x (for the deceased males 0-64 years of age)

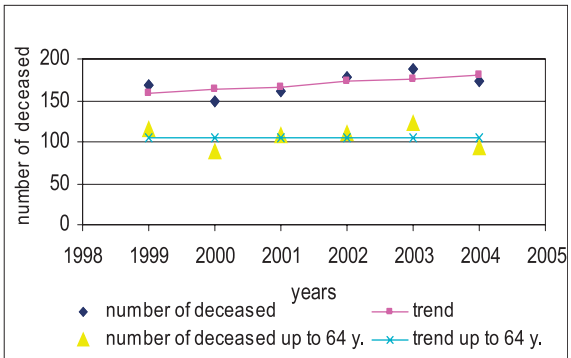

CHART 4. Female mortality trends of breast cancer for all ages and age group 0-64 years
Y= 165,7+1,6x (for the deceased females of all ages)
Y= 105,8- 0,08x (for the deceased females 0-64 years of age)

50,3 and 41,3. Percent of males in the total number of the deceased was increasing, while the number of females was decreasing, which matches the number of the deceased in this age group (Table 2 and Chart 1). Mortality rate of the deceased males of all ages was increasing, and slightly less increasing for age group 0-64 years (Chart 2). Mortality rate of the deceased females of all ages was slightly increasing compared to males 0-64 years of age and it has a decreasing tendency (Chart 3). The most frequent locations of malign diseases were lung, tracheae and bronchi (for males), breast (for females), colon, sigma and rectum, liver and intra-hepatic tract, pancreas and brain (Table 3). The frequencies of the diseases' occurrence changed, so the colon-rectal

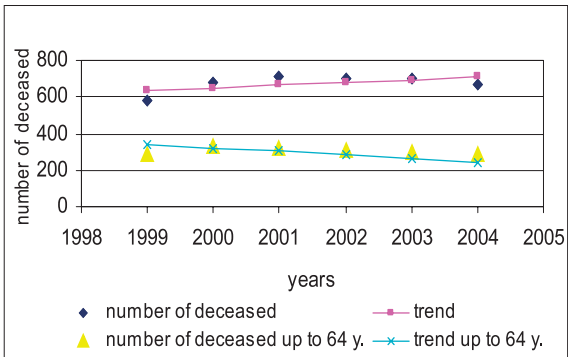

CHART 5. Lung cancer mortality trends in males of all ages and for age group 0-64 years
Y=660,4+12,75x (for the deceased males of all ages)
Y=326,6-6,76x (for the deceased males 0-64 years of age)

RATE PER 100 000 INHABITANTS

LOCATION	1999	2000	2001	2002	2003	2004
lung	31,3	36,3	36,7	37,2	37,0	36,1
breast	14,0	12,3	13,1	14,6	15,4	14,2
colon, sigma, rectum	10,7	10,7	9,3	-	13,3	12,8
liver and intra-hepatic tract	10,7	11,8	12,0	11,1	11,9	12,8
pancreas	5,9	5,5	5,5	6,9	7,1	6,9
brain	5,5	5,3	6,1	6,6	6,1	6,7

TABLE 3. Mortality rates of the most frequent locations of the malign diseases

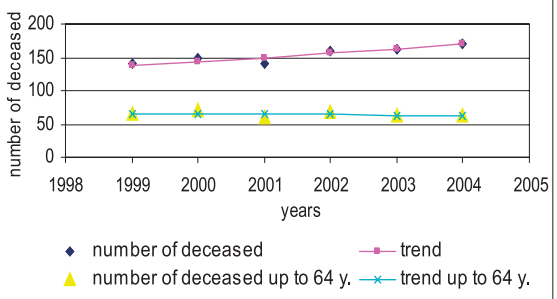

CHART 6. Lung cancer mortality trends in females of all ages and for age group 0-64 years
Y=147,8+2,14x (for the deceased females of all ages)
Y=65,0-0,32x (for the deceased females 0-64 years of age)

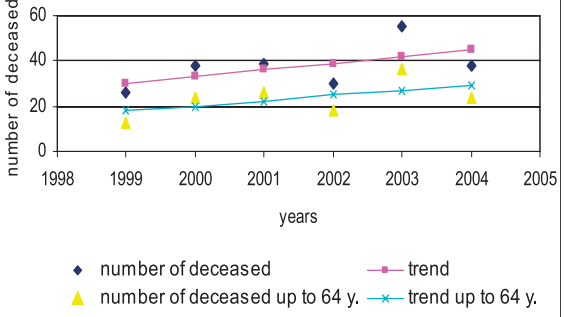

CHART 7. Cervix cancer mortality trends in females of all ages and for age group 0-64 years
Y= 35,07+1,1x (for the deceased females of all ages)
Y= 21,6+0,77x (for the deceased females 0-64 years of age)

cancer and liver cancer replaced stomach cancer as the most frequent ones. Mortality of breast cancer in females was constantly increasing with the exception of females in age group between 0-64 year (Chart 4). Lung cancer was the most frequent type of cancer in males. Mortality of this type of cancer in males of all age groups was constantly increasing. The fact that the mortality rate was decreasing for the age group of 0-64 years casts light on the situation as such (Chart 5). Lung cancer mortality in females of all age groups was increasing more slightly when compared to males. However, mortality in the age group 0-64 years of females was stagnating and was not decreasing at the same pace as in males group (Chart 6). Just like in East European countries, an increase in female mortality caused by cervix cancer exists in Bosnia and Herzegovina. It was increasing for females of all age groups, including age group 0-64 (Chart 7).

Discussion

In Federation of Bosnia and Herzegovina in 2004, 20 % of all mortality causes were due to cancer, which is below Slovenian (26%) and European average (28%). According to World Health Organization, general mortality in Europe amounts to 140/100000 and is considerably higher in the transition countries (Hungary-203/100000). In Federation of Bosnia and Herzegovina, general mortality rate concurs with European average. Since 1995, malign diseases caused mortality rate in young population has started to decline worldwide. In Federation of Bosnia and Herzegovina, in the post-war period, mortality rate of population below 65 has decreased, in females in particular, which is explained by the improvement of diagnostics and treatment. Analysis of mortality caused by cancer in Europe shows 10% decrease in the case of lung cancer, intestinal and urinary bladder (4). Number of intestinal and uterus cancer in females has decreased by around 20%. Number of stomach cancer decreased by 30% and leukemia by 10% (in both males and females). Mortality trend of ovarian and prostate cancer is constant. The most considerable changes in terms of trend increase were recorded in the case of lung cancer in females in the Central and Eastern Europe (5). The most striking is the trend of increase of colon-rectum cancer in the transition countries, including Bosnia and Herzegovina, in both males and females, which is associated with unhealthy life style (bad eating habits, obesity and lack of physical activity). In Slovenia, an increase in colon cancer caused death was observed in males. Mortality of this cancer type is above European average. Similar situation was recorded in the countries of Eastern and Central Europe. It is interesting to note that in the concerned countries, colon cancer caused mortality was below European average in early 1980's while, in late 1990's, it was above European average (6). Like in most other European countries, in Federation of Bosnia and Herzegovina the most frequent cancer types were lung cancer in males, and breast cancer in females. In countries where the number of male smokers has dropped, the number of cases of lung cancer was reduced (7). Simultaneously, the number of females with lung cancer has increased. Similar situation is in Federation of Bosnia and Herzegovina - trend of mortality of lung cancer in males up to 64 years old has significantly decreased, and is stagnating in the case of females. Breast cancer caused mortality rate increase can be explained by higher frequency of this disease in elderly age whereas decreasing trend was recorded in female age group of 65 years (8). In prognosis of the future trends of cancer mortality, change in number of population and ageing of population will have significant role, because malign disease caused mortality rate is highest with elderly population. It is assumed that, up to 2015 in 25 European countries with current population of 450 million, the population

size will decrease by 2 million i.e. by 0,5%. Simultaneously, the number of elderly people of 65 years of age will increase – they will constitute 20% of the total population. General diseases caused mortality trend will mostly depend on rates of mortality caused by lung and breast cancer (9). Total number of the deceased of cancer in 25 European countries was 1,1 million in 2000. Based on 2000 data, it is envisaged that in 2015, number of the deceased will increase up to 1,4 million i.e. there will be 280 000 death cases (25%). Increase will be more prominent in males than in females (10). It is envisaged that in 2015, EU countries with the highest number of malign disease mortality cases will be France, Germany, Holland and Spain, and with the lowest number will be Italy and Great Britain (11). Amongst other European countries, Poland will sustain considerable mortality increase. In Federation of Bosnia and Herzegovina, mortality increase of total population and population over 65 years of age is envisaged, as well as in other European countries. Ageing of population will affect it. According to estimations made in 2004, individuals older than 65 constituted 14,1% of the population in Federation of Bosnia and Herzegovina (12). Primary and secondary prevention will have important role in reduction of mortality caused by malign diseases (13). Promotion of healthy life styles is the national priority in reduction of mortality, especially caused by lung cancer and colon-rectal cancer. Secondary prevention implies screening for cervix, breast, colon-rectal and prostate cancers (14). Preventive examinations for the purpose of early detection of cancer should be the responsibility of general practitioners and gynecologists (15). Diagnosis and treatment of the malign diseases should be covered by health insurance.

Conclusion

- Important factors for the estimation of trends are census and data from the cancer register. Last census in Bosnia and Herzegovina was carried out in 1991, and cancer register is in its inception phase at entity level.
- Standardized rate of cancer mortality for 2004 in Federation of Bosnia and Herzegovina concurs with the European average rate.
- It is expected that mortality will decrease in the population below 65 years of age, which is an encouragement.
- The most frequent cancer types are lung cancer in males and breast cancer in females. Mortality list of cancers is similar to the European one.
- Estimation of mortality trend of malign diseases in Federation of Bosnia and Herzegovina will be improved once the data from the cancer register are available.

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