

Evaluation of Turkey Ministry of Health 1983-2001 cancer incidences and cancer death rates in the Burden of Disease Study data

NAZAN YARDIM, SALİH MOLLAHALİLOĞLU, ENVER ÇAKIR

Refik Saydam Hygiene Center Presidency, School of Public Health, Ankara-Turkey

ABSTRACT

This study aims to evaluate the annual changes in the incidence of cancer and region-based rate of cancer mortality. The cancer incidence in Turkey was calculated from the data obtained from the Cancer Control Department of the Ministry of Health (MoH). National Health Accounts and the Cost-Effectiveness Study 2004 (NBD-CE 2004) data was used to account the cancer mortality rates. Then, they were standardized through "direct standardization method", which is based on Turkish and European standard population. If standardized by the European population, cancer incidence was noted as 95.1% for the year 2001. It was relatively lower in the Southeastern Anatolia and the Black Sea Region if the whole country was considered. Standardized cancer mortality rate was 147.2/100,000 in general which was 144.1/100,000 in the Black Sea Region and 142.5/100,000 in the Eastern Region. Cancer incidence and cancer mortality rate in Turkey is lower than that of the European Union (EU) countries, which might be caused by two factors: the fact that Turkey has a younger population than the EU countries and/or cancer data is not collected so properly in Turkey. Community-based registry systems of the world-wide cancer registry systems quality should be developed in order to obtain concrete, clear and unquestionable data on cancer and to find out the actual scope of the problem in Turkey. [Turk J Cancer 2007;37(4):148-153]

KEY WORDS: Cancer incidence, death rate, regions, mortality rate

INTRODUCTION

Cancer and cancer-caused deaths are a major health problem in today's world as a result of keeping infectious diseases under control, improvements in diagnosis and treatment of diseases, increase in the environmental carcinogens, and expansion of the average life duration. Cancer, though being one of the top mortality causes with its high incidence rate, also means a public health problem due to the social and economic burden that it puts on the shoulders of a society. Calculations show that every year ten million people are diagnosed with cancer and six million people die of cancer (1).

13% of all deaths that occurred in 2000 were caused by cancer. More than 60% of cancer-caused deaths and half of the recently diagnosed cases of cancer are reported in developing regions (2).

Following the cardiovascular diseases, cancer occupies the second rank among causes of mortality in males and females. As for the burden of disease list, cancer, with a share of 6.8%, is at the sixth rank in the list (3).

“*Health for All in the 21st Century*” objective of the WHO Region for Europe targets minimum 15% decline in cancer-caused deaths and 25% decline in the pulmonary cancer mortality rate among people under the age of 65 (3).

WHO Office for Europe targets minimum 15% decrease in cancer-caused deaths among 65+ aged people and minimum 25% decrease in lung cancer mortality in parallel with the Health 21 Objectives that refer to “*Health for All in the 21st Century*” (4).

As for Turkey, cancer became notifiable in 1982. Since that time, the information and data on cancer-diagnosed patients have been evaluated by the Cancer Control Department of the Ministry of Health (MoH). “Cancer Registry and Incidence Project” was started in 1992 in order to find out cancer incidence in an accurate and realist manner. On this basis, cancer registry centers were founded in some provinces so that cancer data is collected through an active system and cancer incidence is identified from an accurate and realistic point of view (5).

This study aims to evaluate the yearly changes in cancer incidence in Turkey and region-based rate of cancer mortality.

MATERIALS AND METHODS

The cancer incidence and cancer mortality rates in Turkey were accounted based on the data obtained from the Cancer Control Department of the MoH and National Burden of Disease and the Cost-Effectiveness Study 2004 (NBD-CE 2004) (3,5).

Data obtained from the Cancer Control Department of the MoH was evaluated according to seven geographical regions while data obtained from the NBD-CE 2004 survey was evaluated according to five regions. NBD-CE 2004 data was utilized in order to calculate region-based cancer mortality rates. Cancer mortality rates in Turkey was standardized through age-based direct standardization method depending on Turkish State Institute of Statistics 2000 census data and the standard European population since distribution of age might vary among regions (6,7).

RESULTS

The cancer incidence in Turkey, which was 19.7/100,000 in 1983 increased to 60.6/100,000 in 2001. An outstanding increase was noted in the Aegean Region. The incidence in the Aegean Region, which was noted as 24/100,000 in 1983, increased by the time and reached up to 111.2/100,000 in 2001. Cancer incidence was relatively low in the Southeastern and Black Sea Regions when compared to the entire country (Table 1).

Yearly changes in the cancer incidence was noted in Turkey. According to data for the year 2001, cancer incidence was noted as 60.5/100,000 in general, which were 70.1/100,000 in male and 50.7/100,000 in female. When standardized by the European population, then it was found out to be 95.1/100,000.

No regular trend is available with respect to the cancer incidence in Turkey. Ups and downs noted in some years might be due to the inappropriate collection of data.

The cancer incidence in the WHO Region for Europe was 296.3/100,000 in 1985 and increased to 369.7/100,000 in 2003. In the European Union member states it was noted as 382.5/100,000 in 1995 and then 424.1/100,000 in 2003. Cancer incidence for the year 2001 was 772/100,000 in Hungary; 523.8/100,000 in Sweden, 458.2/100,000 in the United Kingdom and 35/100,000 in Tajikistan (Table 2) (8).

Cancer mortality rates increase as people get older. Cancer mortality rate was 83.0/100,000 in general while it was 101.2/100,000 in the North and 61.5/100,000 in the East (Table 3).

Cancer mortality rates in Turkey was standardized through age-based direct standardization method depending on Turkish State Institute of Statistics 2000 census data and the standard European population since distribution of age might vary among regions. The standardized cancer mortality rate is 147.2/100,000 across Turkey, 149.8/100,000 in the Central Region, 144.1/100,000 in the North and 142.5/100,000 in the East (Table 4).

Cancer mortality rate was noted as 189.5/100,000 in the European Union and was noted as 180.7/100,000 in WHO region for Europe; the highest rate was noted as 268.2/100,000 in Hungary and the lowest rate was noted as 70.8/100,000 in Tajikistan for year 2000 (Table 5).

Table 1
Region-specific cancer incidence in Turkey (per 100,000)

Regions	Years					
	1983	1985	1990	1995	2000	2001
Marmara	42.0	50.2	81.0	42.9	44.0	59.5
Aegean	24.0	44.4	59.0	73.1	70.5	111.5
Mediterranean	8.0	13.1	28.0	44.2	54.9	50.2
Central Anatolia	24.0	19.3	33.0	69.0	36.7	56.1
Black Sea	7.0	21.3	33.0	42.6	56.0	39.5
Eastern Anatolia	1.0	9.9	21.0	45.6	53.3	53.5
Southeastern Anatolia	-	6.3	13.0	24.0	27.0	21.5
Turkey	19.7	26.7	44.0	53.2	49.3	60.5

Source: Ministry of Health, Cancer Control Department

Table 2
Cancer incidence in selected countries (per 100,000)

Countries	Years							
	1980	1985	1990	1995	2000	2001	2002	2003
Bulgaria	232.7	233.1	245.1	285.1	320.1	356.3	376.4	376.4
Finland	311.3	334.0	355.8	398.5	431.4	432.7	447.7	474.9
Hungary	215.4	277.1	270.9	245.3	--	772.0	769.1	774.1
Netherlands	--	--	384.9	419.0	433.0	443.9	450.6	451.1
Norway	370.9	406.7	432.8	459.4	501.2	497.8	500.1	510.6
Poland	182.6	206.8	219.0	272.6	297.2	296.9	301.4	--
Romania	--	154.3	119.4	175.0	197.3	258.2	243.9	240.0
Sweden	421.3	456.4	474.3	474.2	512.6	521.4	523.8	543.4
Tajikistan	--	--	71.7	26.7	43.6	35.0	29.7	35.2
Ukraine	238.6	274.8	300.9	309.3	317.9	317.4	323.7	326.1
United Kingdom	385.9	408.2	480.5	520.7	460.4	458.2	458.2	--
WHO Region for								
Europe	--	296.3	310.9	332.6	360.6	365.9	368.5	369.7
European Union	--	--	--	382.5	402.2	411.6	417.8	424.1

Source: WHO/Europe, HFA Database, January 2006 (8)

Table 3
Age and region-specific cancer mortality rates (per 100,000), Turkey, 2000

Age Groups	Regions					Turkey
	North	West	South	Central	East	
0-4	7.8	7.5	7.7	8.0	8.6	8.0
5-14	8.4	6.8	7.8	8.4	9.9	8.2
15-29	14.3	13.8	14.8	16.0	14.4	14.6
30-44	38.3	37.9	42.1	43.6	41.6	40.3
45-59	121.9	122.0	128.7	133.3	142.1	128.3
60-69	426.3	440.0	417.0	437.9	411.1	430.6
70-79	759.6	778.2	759.2	785.6	770.3	774.3
80 +	1525.2	1674.7	1510.5	1503.4	1236.2	1536.0
Total	101.2	89.1	77.5	89.4	61.5	83.0

Source: NBD-CE Study

Table 4
Region-based standardized cancer mortality rates (per 100,000), Turkey, 2000

Regions	Crude	Standardized*	Standardized**
North	101.2	81.1	144.1
West	89.1	82.7	148.8
South	77.5	82.0	145.1
Central	89.4	85.1	149.8
East	61.5	82.1	142.5
Turkey	83.0	82.6	147.2

Source: NBD-CE Study

*Age-standardized according to population of Turkey

**Age-standardized according to population of Europe

DISCUSSION

In 2000, 56,250 deaths occurred in Turkey due to the cancer with a share of 13.1%. It is estimated that cancer-caused deaths would rise to 14% in 2010, 15.2% in 2020 and 16.2% in 2030 (3).

On the other hand, hospitalization due to cancer in Turkey has increased two times at the last ten years. The fact that population in Turkey has also increased 15% in this period indicates that cancer has a gradually increasing share in hospitalization (9).

As for the year 2001, cancer incidence in our country was 60.5/100,000 and turns out to be 95.1/100,000 when standardized according to the European population.

Based on the Cancer Control Department data, Turkey is a country with the lowest cancer incidence among EU Member States though being a country with cancer incidence higher than that of Tajikistan, which is one of the WHO Regions for Europe countries (Table 2). This situation indicates that Turkey has a young population and cancer data in Turkey is still not collected appropriately as desired since cancer incidence is still low when standardized according to the European population.

Cancer incidence in Turkey, which was 19.7/100,000 in 1983 increased to 60.5/100,000 in 2001. The increase noted is outstanding particularly in the Aegean Region (Table 1). While cancer incidence in the Aegean Region

Table 5
Cancer mortality rates in some countries (per 100,000)

Countries	1970	1980	1990	2000	2001	2002	2003
Bulgaria	147.4	136.9	152.4	150.1	152.1	154.8	152.5
Finland	202.7	189.1	172.4	151.9	149.6	145.9	146.3
Hungary	215.5	239.9	266.7	268.2	265.6	262.3	263.8
Netherlands	221.9	221.3	214.9	198.5	194.7	193.9	191.0
Norway	171.4	174.1	179.1	175.2	174.3	175.0	170.4
Poland	178.0	194.8	212.8	215.9	216.5	216.7	214.7
Romania	146.0	149.4	147.9	170.8	175.0	177.6	177.9
Sweden	176.7	184.1	166.2	157.7	151.1	154.9	--
Tajikistan	--	--	113.0	70.8	70.9	--	--
Ukraine	--	--	184.4	173.2	169.0	167.0	164.3
United Kingdom	215.2	218.1	220.5	193.8	191.0	189.7	186.4
WHO Region for Europe	--	185.8	194.5	180.7	178.3	177.1	175.9
European Union	--	--	204.1	189.5	187.6	186.3	185.0

Source: WHO/Europe, HFA Database, January 2006

was high when compared to the whole country, cancer incidence in the Black Sea and Southeastern Anatolia Region was lower. The fact that more cases of cancer are reported in the Aegean Region might be due to the importance given to the collection of cancer data. Comparison of cancer data among different regions, however, might lead to mistakes because the quality of data collection is not the same in all regions across Turkey. To give an example, cancer data in İzmir is collected with an active system while it is collected in many other regions based on physicians' diagnosis through a passive system.

In many cancer types, increase is possible in the incidence in parallel with aging. Age groups in regions might be different from each other, thus, comparisons that ignore age groups might be mistaken. Cancer incidence data in different population groups should be compared based on the age groups. So, Turkey, with its young population, would be available for comparison within the regions and other countries regarding cancer mortality rate.

Cancer mortality rate in the Black Sea Region was 101/100,000, which is higher when compared to Turkey (Table 4). The fact that cancer mortality rate in the Black Sea Region is higher than other regions might be due to the

fact that the population is old-aged. For instance, share of the population of 60+ in Turkey was 8.4% in 2000 while it was 11.4% in the Black Sea Region. Cancer mortality rate in the North is 81/100,000 when standardized according to the age groups within Turkish population.

In another study conducted in Turkey, the age-standardized cancer mortality rate in 2003 was found to be 99.97/100,000 among male and 46.81/100,000 among female (10).

As for the year 2000 standardized cancer mortality rate in Turkish population was found to be 147.2/100,000 (Table 4); 189.5/100,000 in the EU Member States; 268.2/100,000 in Hungary and 70.8/100,000 in Tajikistan (Table 5). When cancer mortality rate in Turkey is standardized it gets closer to the EU countries.

The fact that cancer mortality rate is close to that in the EU Member States although the cancer incidence in Turkey is almost $\frac{1}{4}$ of the EU indicates that the NBD-CE Study results are acceptable.

In many countries, cancer incidence is about two times the cancer mortality rate whereas it is two/ third of cancer mortality rate in our country.

As seen obviously, cancer incidence and cancer mortality rate in Turkey is below the European average. Turkish cancer incidence data obtained from NBD-CE Study is relatively higher when compared to data obtained from the Cancer Control Department's data which indicates that cancer registry system does not function well in Turkey.

Statistical data on cancer in Turkey is far from being in-depth and detailed to present the case and status of cancer in Turkish population not only because community-based registration system is not available for now but also the existing system being insufficient. Data collected by Turkish MoH is far from giving tips about accurate cancer incidence since reporting from different public agencies to the MoH is not satisfactory due to the insufficient number of the relevant personnel.

A country-wide increase is noticed in the number of cancer cases in general. However, it should be kept in mind that this increase might be due to the improving facilities of diagnosis and treatment, access to health care services and rising consciousness of well-being. So, community-based registry systems of the world-wide cancer registry systems quality should be developed in Turkey in order to obtain concrete, clear and unquestionable data on cancer and to find out the actual scope of the problem.

ACKNOWLEDGEMENTS

We extend our most sincere thanks to the Cancer Control Department of MoH for their invaluable assistance to provide the required data for us.

References

1. World Health Organization. World Health Report 1998, Translation edited by: Metin B, Akın A, Güngör İ. Turkish Ministry of Health, Department of Foreign Relations, Ankara, 1998;53.
2. Shibuya K, Mathers CD, Pinto CB, et al. Global and Regional Estimates of Cancer Mortality and Incidence by Site: II. Results for the Global Burden of Disease 2000. *BMC Cancer* 2002;2:37.
3. Turkish Ministry of Health, RSHCP, School of Public Health, National Burden of Disease and Cost-Effectiveness Study, Final Report on the Burden of Disease, 2005, Ankara,
4. World Health Organization. Health 21. Translation edited by: Öztürk Y, Günay O. Health for All in the 21st Century. Kayseri, 2000;61-2.
5. Başaklar AC. Diagnosis and Treatment Guideline of Basic Information on Cancer. Turkish Ministry of Health, Department of Cancer Eradication, Ankara, 1998;1-11.
6. World Health Organization Europe. European Health for All Database. WHO Regional Office for Europe. 2005.
7. Sümbüloğlu K. Statistical Methods Specific to Health. 3rd ed. Ankara: Hatipoğlu Publications, 1990;96-105.
8. WHO/Europe, HFA Database, January 2006.
9. Turkish Ministry of Health, Health Statistics 2003. Research, Planning and Coordination Council. Ankara, 2004.
10. Şengelen M, Kutluk T, Fırat D. Cancer Statistics in Turkey and In the World (1996-2003). Turkish Association for Cancer Research and Control, Ankara, 2007.