

## RESEARCH COMMUNICATION

# Incidence and Epidemiological Features of Cancers of the Genitourinary Tract in Izmir between 1993-2002

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### Abstract

**Background:** There is a relative lack of epidemiological data on cancer in Turkey, which is a large country with a population of 71 million. The first population-based registry in the country is Izmir Cancer Registry (ICR) which was not established until 1992. The present study, aiming to address the gap in this kind of epidemiological data for this part of the world, reports the incidence of cancers of the genitourinary tract in Izmir province over a ten year period. **Methods:** Cancer incidence data for 1993-2002 was obtained from the ICR database, which employs a population based registry system, and actively collects data by following international registration rules. Annual crude and age standardized incidence rates were calculated for the whole period and also for earlier and later periods. **Results:** The age-standardized incidence rate (world population) for all sites was 198.3 per 100,000 for males and 116.4 per 100,000 for females. The most common primary sites for men were lung (35.6%), bladder (7.8%), colon and rectum (6.1%), larynx (5.7%) and prostate (5.4%). For women, the principal cancers were breast (28.7%), colon and rectum (7.2%), corpus uteri (5.3%), cervix uteri (4.8%) and lung (4.7%). Urogenital cancers accounted for 11.2% of all new cancer cases for the 1993-2002 period in Izmir. Of the total, 89.6% were observed in males and 10.4% were diagnosed in females. Carcinoma of the bladder was the most common among the urogenital cancers in Izmir province (Age standardized incidence rate, world standard population 17.1 per 100 000). **Conclusions:** Bladder cancer incidences were quite high, especially for men, and appear to be increasing. Prostate cancer has lower incidence rates as compared to western countries, but the trend is for rise. Although there might be an underestimate of incidences, owing to an inability to use data from death certificates, the overall profile is an accurate reflection of incidence in this region of Turkey and provides adequate information for planning strategies for cancer control.

**Key Words:** Genitourinary tract cancers - epidemiology - incidence and mortality - Izmir, Turkey

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### Introduction

Incidence rates of urogenital cancers (especially prostate cancer) vary widely by country. In this picture, Western European and North American countries have higher rates than others. However, there are also notable international differences within ethnic groups. For example, prostate cancer rates among men of Japanese origin living in the United States are reported as 4–5 times higher than those among Japanese men in Japan (Curado et al., 2007). While such differences and trends are highly suggestive of an influence of a “Western” lifestyle upon prostate cancer risk, the specific role of diet in prostate cancer etiology is far from clear (Stram et al., 2006). To arrive to such conclusions data quantity and quality becomes the foremost criterion. Yet, data on incidence, prevalence, and disease specific mortality are frequently incomplete, not very reliable or not available in many less developed countries particularly those in Asia and Africa. In Turkey the situation was not much different, however

with the establishment of first population-based cancer registry in Izmir province, cancer incidence collection has become more systemized.

Turkey is situated in both the European and Asian continents, and has a total population of 71.5 million (2008 census). Izmir with its population of 3.7 million is located in the extreme west of the country, on the Aegean Sea coast. 85% of its population lives in urban areas, with the remaining 15% living in rural parts (2007). The third largest city of the country, Izmir has a relatively young age structure, 21% of the population is under 15 whilst only 7.7% is over 65. Life expectancy at birth is 69 for males and 74 for females (2008 census).

The city of Izmir is the major commercial and industrial centre of Aegean region, while there are agricultural activities (tobacco, cotton, vegetables, fruits, etc.) in the rural areas of the province; tourism is one of the main industries for Izmir. The city is also a destination for substantial internal migration, especially for people coming from the east and southeast regions of Turkey. As

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a result, the population comprises a mixture representing the major ethnic and socio-economic groups of the whole country. These population characteristics of Izmir as well as the quality and quantity of data available makes it an ideal candidate to study cancer incidences in the region.

Although the international variations in the incidence of cancer have been well documented, there was considerably less published data on cancer incidence in Turkey (Bilir, 1977). The countrywide passive data collecting system in place since 1983, had failed without producing any considerable results. In addition, published work has generally used sporadic relative frequency information obtained from hospitals (including Hacettepe and Ege Universities) and pathology departments, and suffered from several selection biases like not being representative of a determined region.

The foundation of Izmir Cancer Registry (ICR) as the first population-based cancer registry in Turkey was a major step on addressing the data quality and quantity issues. ICR was founded in May 1992 by the Ministry of Health and Ege University, in collaboration with the Turkish-American Collaborative for Health Research and Programming, University of Massachusetts. Now, the organization is functioning as a department of the Izmir Provincial Health Directorate and has memberships in International Association of Cancer Registries (IACR) and the European Network of Cancer Registries (ENCR). Data is actively collected from the sources by well-trained registry staff following international rules and standards of the cancer registration.

In this study, using the data from the ICR database, we investigate urogenital cancer incidence in Izmir during 1993-2002 period and compare our results with cancer incidence rates of other countries.

## Materials and Methods

The data used in this analysis contains newly diagnosed cancer cases and were collected by the staff of Izmir Cancer Registry from medical records of the hospitals and other health facilities located in Izmir province (Eser, 2008). Cases were ascertained from records of university hospitals, state hospitals, private hospitals, nursing homes, and the other health service units which provide diagnostic or treatment services for cancer.

Data collected on each cancer case included socio-demographic information of the patient, primary cancer site/type and information on morphology, diagnosis confirmation, extent of disease, and passive patient follow-up for vital status. The site, morphology and behavior of the tumors were coded according to the International Classification of Disease for Oncology Third Edition (ICD-O- 3) of the World Health Organization (WHO) (Fritz et al., 2000), which was translated into Turkish by Canda (Canda 2002). International Agency for Research on Cancer (IARC)/International Association of Cancer Registries (IACR) rules were followed in coding multiple primaries (Carli et al., 2009). An advisory committee, which has a right to make strategic decisions, provided supervision of the overall registration activity. Of note, members of the advisory committee were senior

employees working in different fields of oncology in the major hospitals of Izmir.

It is possible that some Izmir residents with cancer chose to be treated elsewhere, such as Istanbul or abroad. However, this is unlikely to constitute more than 1% of the cancer patients, bearing in mind the social composition of the population. The ICR has also collected copies of death certificates mentioning cancer from the Provincial Health Directorate, but because of poor quality and lack of information regarding socio-demographic data and addresses, these data could not be matched with the records of incident cases. Therefore, death certificates were not used as a source for the incidence rates for the 1993-2002 periods. Also, in-situ cases were excluded .

All data collected were computerized using a customized version of the CANREG-4 which was created by the Department of Descriptive Epidemiology of IARC for population-based cancer registries. This comprehensive computer program includes facilities for detecting duplicate registrations of the same cancer, multiple primaries, and for performing checks on the validity of the entered data.

Cancer cases among residents of Izmir province, incident during 1993-2002 were included in the present analysis. For the source of population data, two options were considered: (1) extrapolation from 1990 national census; (2) annual registrations by health centers of the Provincial Health Directorate of Izmir. After evaluating annual figures, the decision was to use the latter, because it was updated annually and reflected internal immigration more precisely. Therefore, the person-years of population at risk by sex and 5-year age groups were estimated based on population tables for 1993-2002, which were prepared by the Provincial Health Directorate of Izmir. The average annual population at risk, by age group and sex, is shown in Figure 1. For the analyses of time trends, the available time-span was divided into two periods: 1993-1997 and 1998-2002.

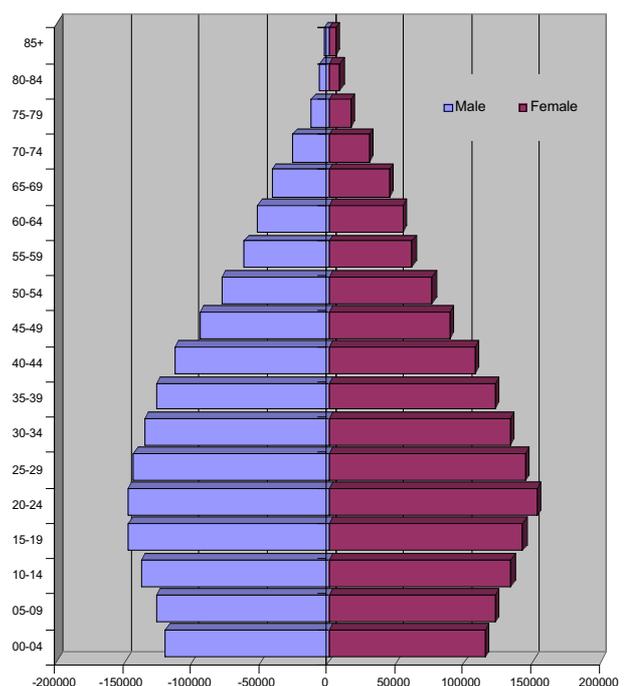


Figure 1. Population Pyramid Izmir, 1993-2002

**Table 1. Most Common Cancers, Izmir, 1993-2002**

Primary site	No. of patients	RF (%)	Crude	ASR
<b>Males</b>				
1. Lung	10,116	35.6	64.2	70.9
2. Bladder	2,201	7.8	14.0	15.9
3. Colon and Rectum	1,717	6.1	10.9	11.9
4. Larynx	1,630	5.7	10.3	11.2
5. Prostate	1,541	5.4	9.8	11.6
All sites	28,390	100.0	180.1	198.3
<b>Females</b>				
1. Breast	5,155	28.7	33.1	32.5
2. Colon and Rectum	1,291	7.2	8.3	8.6
3. Corpus uteri	961	5.3	6.2	6.4
4. Cervix uteri	860	4.8	5.5	5.5
5. Lung	844	4.7	5.4	5.6
All sites	17,984	100.0	15.4	16.8

RF, Relative frequency; ASR, age-standardized rate (world population) per 100,000

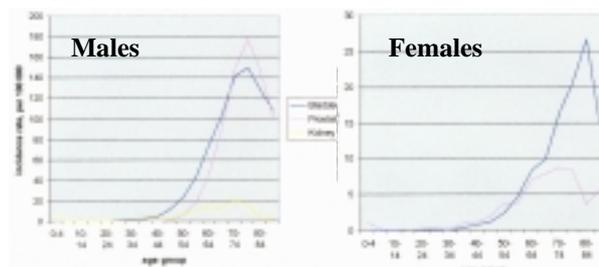
**Table 2. Incidence Rates for Urogenital Cancers, Izmir, 1993-2002**

Primary site	Male				Female			
	No.	RF	Crude	ASR	No.	RF	Crude	ASR
Bladder	2,201	7.8	14.0	15.9	276	1.5	1.8	1.8
Kidney	412	1.5	2.6	2.9	241	1.3	1.5	1.6
Pelvis Renalis	44	0.2	0.3	0.3	13	0.1	0.1	0.1
Ureter	14	0.0	0.1	0.1	7	0.0	0.0	0.0
Prostate	1,541	5.4	9.8	11.6	-	-	-	-
Testis	401	1.4	2.5	2.2	-	-	-	-
Penis	4	0.0	0.0	0.0	-	-	-	-
Other genitalia	7	0.0	0.0	0.0	-	-	-	-
Other urinary	14	0.0	0.1	0.1	1	0.0	0.0	0.0

RF, Relative frequency; ASR, age-standardized rate (world population) per 100 000

**Results**

Of all 46,305 cancer cases registered between January 1993 and December 2002, 5,176 (11.2%) patients had urogenital cancer. Of all urologic cancers, 4,638 (89.6%) were observed in males and 538 (10.4%) were in females. The age standardized incidence rate (ASR) (world



**Figure 2. Age Curves for Urothelial Cancer Data**

population) for all sites were 198.3 per 100 000 for males and 116.4 per 100 000 for females. The most common primary sites for men and women are shown in Table 1. Table 2 summarizes data on urological cancers and age specific rates are given in Table 3.

**Urothelial cancers:** For men, bladder carcinoma was the second common malignancy across all cancer types and was at the first rank among the urogenital cancers in Izmir province. While relative frequency of cancer of the bladder increased from 7.65% for 1993-1997 to 7.82% for 1998-2002 periods, ASR increased from 14.2 per 100 000 to 17.1 per 100 000 for the same periods (Table 4). The disease noticeably less affected females than males, the male: female ratio in incidence of bladder cancer is 8.6:1.0.

According to the number of cases within 10-year age groups, 66.4% of all male bladder cancers and 60.5% of all female bladder cancers were seen among the 55-74 age-group. Both among men and women age-specific annual incidence rates show a moderate but linear increase until age 55 years, with acceleration of incidences thereafter (Table 3, Figure 2). Of all bladder cancers, 85.1% were transitional cell carcinoma; 2.3% squamous cell carcinoma; 1.2% adenocarcinoma, and 8.9% unspecified type. When we excluded unspecified types, these proportions were formed as 93.4%, 2.6%, and 1.4% for transitional cell carcinoma, squamous cell carcinoma and adenocarcinoma, respectively. Incidence rates of the renal pelvis and ureteral malignancies for males and females were considerably lower (Table 3).

**Table 3. Age-specific Incidence Rates by Site for Urogenital Cancers in Izmir, 1993-2002**

	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-74	85+
<b>Males</b>																		
Bladder	0	0	0	0.1	0.3	0.6	1.5	2.8	4.6	12.2	23.7	43.8	74.0	103.0	141.5	150.1	128.0	108.0
Prostate	0	0	0	0	0	0	0.1	0.3	0.2	0.8	6.2	18.4	45.0	89.5	148.7	177.8	147.2	102.3
Kidney	1.3	0.2	0	0	0	0.1	0.4	0.9	2.3	3.6	6.5	10.2	13.0	12.3	21.5	16.2	4.8	2.8
Testis	0.5	0	0.3	1.8	3.3	6.2	4.8	5.3	3.1	2.3	1.5	1.3	1.0	0.5	2.6	0.8	0	2.8
Pelvis	0	0	0	0	0	0	0.1	0	0.2	0.8	0.8	0.2	1.3	2.2	2.3	3.1	0	0
Ureter	0	0	0	0	0	0	0	0.1	0	0	0	0.3	0.6	1.2	0.8	0	0	2.8
Penis	0	0	0	0	0	0	0	0	0	0.1	0	0.2	0	0.5	0	0	0	0
Other genitalia	0	0	0	0	0	0	0.1	0	0.1	0.1	0	0	0.2	0.2	0.8	0	0	0
Other urinary	0	0	0	0	0	0	0	0.1	0	0	0.1	0.2	0.2	1.4	0.8	0.8	0	0
All sites	17	12	11	17	16	23	34	62	118	212	354	570	847	1,172	1,475	1,430	1,114	884
<b>Females</b>																		
Bladder	0	0	0	0.1	0.1	0.1	0	0.4	0.8	1.2	2.4	4.6	8.4	9.8	16.4	20.5	26.6	14.9
Kidney	1.2	0.2	0.1	0.1	0.2	0.3	0.2	1.0	1.2	1.9	3.8	3.8	7.0	7.8	8.7	8.3	3.6	5.6
Pelvis	0	0	0	0	0	0	0	0	0	0.1	0	0	0.4	0.7	2.0	0	1.2	0
Ureter	0	0	0	0	0	0	0	0	0.1	0	0	0.2	0.2	0.2	0.7	0.6	0	0
Other urinary	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0
All sites	14	10	10	10	13	22	47	80	136	204	259	314	419	479	634	640	520	472

**Table 4. Incidence Rates of Urothelial Cancers for the Periods of 1993-1997 and 1998-2002**

	Bladder		Prostate		Kidney		Testis		Renal Pelvis		Ureter	
	93-97	98-02	93-97	98-02	93-97	98-02	93-97	98-02	93-97	98-02	93-97	98-02
<b>Males</b>												
No. of cases	885	1,316	522	1,019	148	264	172	229	18	26	5	9
RF (%)	7.65	7.82	4.5	6.1	1.3	1.6	1.5	1.4	0.16	0.15	0.04	0.05
Crude	12.1	15.6	7.1	12.1	2.0	3.1	2.3	2.7	0.2	0.3	0.1	0.1
ASR	14.2	17.1	8.9	13.8	2.3	3.3	2.1	2.3	0.3	0.3	0.1	0.1
<b>Females</b>												
No. of cases	103	173	-	-	100	141	-	-	3	10	2	5
RF (%)	1.43	1.62	-	-	1.4	1.3	-	-	0.04	0.09	0.03	0.05
Crude	1.4	2.1	-	-	1.4	1.7	-	-	0.0	0.1	0.0	0.1
ASR	1.6	2.0	-	-	1.6	1.7	-	-	0.0	0.1	0.0	0.1

RF, Relative frequency; ASR, age-standardized rate (world population) per 100,000

**Prostate:** Prostate cancer was the fifth most common cancer in men and the second most common urologic cancer in Izmir province. Relative frequency of the prostate cancer among the all sites was 4.5% for 1993-1997 periods and 6.1% for 1998-2002 periods. Age-standardized incidence rates (world population) increased from 8.9 per 100 000 to 13.8 per 100 000 for the two periods (Table 4).

**Kidney:** In both males and females, the relative frequency of kidney cancer was similar in the two periods, but a higher incidence was observed in males in the later period; the male: female ratio was 1.9:1.0 (Table 4).

**Testis:** Increase was not seen for relative frequency and incidence rate of testicular tumor between the two different time periods. For 1993-1997 and 1998-2002 periods, relative frequencies were 1.5% and 1.4%; age-standardized incidence rates were 2.1 per 100 000 and 2.3 per 100 000, respectively (Table 4). But, it was the most common cancer among men aged 15-34 years. Of all testicular tumors, 57.1% were observed in this age period (17.8% of all site cancers) (Table 3).

## Discussion

In this paper, we present the long-term results of Izmir urogenital cancer statistics which compare the two 5 years periods, 1993-1997 with 1998-2002. These data can be accepted as the first accurate results for Turkey. The first paper that represents the outcomes of the first population based cancer registry data covering the province of Izmir for 1993-1994 was presented in 2001 (Fidaner et al., 2001).

Urothelial cancer is one of the most common cancers worldwide, with the highest incidence in industrialized countries. As shown in Table 5, ASR from 11.1 per 100,000 to 42.5 per 100,000 for males were reported from Europe (Slovenia, Belgium) for 1993-1997 periods. The lowest incidence rates were reported from Asia (China) and South America (Puerto Rico, Martinique). In the EU, carcinoma of the bladder was the fifth most common malignancy (Ibrahim and Khaled 2005; Ferlay et al., 2007).

In Izmir province, bladder cancer was the second most common malignancy and was the first among the urologic cancers in males. For 1998-2002 periods ASR is 15.9 per 100,000 among men and 1.8 per 100 000 among women.

Females are considerably less affected by the disease than males, the male: female ratio in incidence of bladder cancer is 8.6:1.0; this ratio varies from 1.1:1.0 in eastern Africa and 2.1:1.0 in South Africa, to 5:1 in northern Africa and 5.1:1.0 in southern Europe. This ratio was 10.4 for Denmark, 9.6 for Iceland, 8.6 for the UK (Ferlay et al., 2007), 7.4 for Jordan, 6.9 for Israel (Arabs) and 5.3 for Cyprus (Ibrahim and Khaled 2005). We see the same pattern in the male: female ratio in incidence of lung cancer (12.7:1.0) in Izmir and these big differences between sexes can be explained with substantially lower smoking prevalence in females. We see that the three of four leading cancers in males in Izmir can be largely attributed to tobacco. A national survey undertaken in 1988 (Bilir and Onder, 2000) reported that the overall prevalence of smoking among adults (age >15 years) was 43.6% in males and 24.3% in females, while according to a number of recent (2002-2005) surveys the smoking prevalence range between 49.0-59.4% in males and 17.6-18.9% in females (Turkish Burden of Disease Study, 2004; WHO 2007). The high rates of preventable cancers can be regarded as proxy measures of the performance of a health care system.

We found that 85.1% of all bladder cancers and 93.4% of all specified types was urothelial carcinoma (transitional-cell epithelium). The histological pattern of the bladder tumors in Izmir, resembles data of North America, Europe and Australia where 92-99% of bladder cancers with available histology are urothelial carcinoma as it is expected; whereas the proportion is around 70-80% in Southeast Asia, and substantially less than 50% in different parts of Africa (el-Groeneveld et al., 1996; Mavla et al., 2001; Scelo and Brennan, 2007). Other types of bladder carcinoma include squamous-cell carcinoma and adenocarcinoma. The proportion of SCC varied from 54 to 81% of all bladder cancer cases in different areas of endemic schistosomiasis infection in some Middle Eastern and African countries, which contrasts to Western countries, where the frequency of SCC in bladder cancer cases is much lower about 3 to 10% (Mostafa et al., 1999).

Age-specific annual incidence rates for male bladder cancer showed a moderate but linear increase up until age 55 years, with a greater increase thereafter (Figure 2) in Izmir. We see the same age pattern in countries where urothelial bladder-cancer histology predominates, on the contrary to the pattern in Egypt, where the annual bladder cancer incidence rate rises more sharply before 55 years

**Table 5. ASR\* Incidence Rates of Bladder Cancer for Different Countries, by Sex for the Two Different Periods**

Country	1993-1997		1998-2002	
	Male	Female	Male	Female
Belgium, Limburg	42.5	7.9	25.8	5.1
France, Doubs	30.4	4.5	15.8	2.1
U.S, New Jersey, white	28.0	3.4	28.5	7.8
Israel, Jews	27.0	5.5	28.1	5.3
Israel, Arabs	15.5	2.2	18.1	1.7
England*	23.9	6.7	25.2	7.0
U.S, California	19.0		19.0	4.8
U.S, Louisiana	16.6	5.2	19.6	4.9
Turkey, Izmir	14.2	1.6	17.1	2.0
Slovenia	11.1	2.5	14.4	3.3
Algeria	10.7	2.3	4.5	0.5
China, Shanghai	6.2	1.9	8.1	2.8
France, Martinique	3.6		7.1	1.6
The Gambia			1.3	0.5
Egypt			27.9	5.4
U.S SEER 14			20.9	5.4
Cyprus			20.7	3.5
Jordan (1996-2001)			13.2	1.8

\*ASR, age-standardized incidence rate (per 100 000) (world population); \*South and Western Regions; Ref.: [9,10]

of age than afterwards (Curado et al., 2007).

The prostate cancer was the fifth most common malignancy in Izmir. Although the age-standardized incidence of prostate cancer increased from 8.9 per 100 000 to 13.8 per 100 000 between the two time periods (i.e. 1993-1997 & 1998-2002), it is still lower (half or one third) than those seen in most of the European countries. The prostate cancer figures of Izmir are similar with the incidences of most of the Asian populations. The incidence of prostate cancer varies widely between countries and ethnic groups. The etiology of prostate cancer is unclear; but lifestyle, diet, environmental agents, and heredity causes are believed to be etiological factors. These factors can be responsible to the international variation in the incidence of prostate cancer. The lower rates seen in Izmir compared to European communities might partially be attributed to high consumption of the Mediterranean diet in Izmir. Nevertheless, when we look at the very high incidence rates of lung cancer, one can also argue that the high prevalence of lung cancer may lead to death of men before they have a chance to get a prostate cancer diagnosis. Also, it is a well known phenomenon that the reported incidence of prostate cancer is likely to be increased by the widespread usage of prostate-specific antigen testing followed by ultrasound guided needle biopsy in more developed countries.

To a greater extent than other cancers, this disease affects older men. Age-specific incidence rates for prostate cancer increased with increasing age up to the age of 79 steeply and after that age a decreasing slope had been observed. Same steeply increasing trend by age is observed almost for all the populations. While the rates continue to rise up to the age of 85 and over without any decline in some European countries (i.e. Spain, Germany, UK), the peak can be seen five years later in some others (i.e. The Netherlands, France) (Curado et al, 2007). For USA

(SEER 14 registries) the peak is seen five years earlier, at 70-74 age group. However, these age shifting can be explained with aggressive PSA screenings in USA and better accessibility to appropriate health services for elderly in Europe in comparison with Turkey.

ASR of the kidney cancer in men in Izmir was approximately double of those in women (the male: female ratio is 1.9:1.0). Worldwide, male: female ratio in incidence of kidney cancer is 1.6:1.0 Ferlay et al., 2004). The highest annual incidence rate of kidney cancer in both sexes occurs in the Czech Republic (21.1 per 100 000 in men and 10.2 per 100 000 in women) Scelo and Brennan, 2007). In both sexes, the lowest annual kidney cancer incidence rates were found in Africa and Asia (i.e. 0.5 and 0.7 per 100 000 in men and 0.3 and 0.4 per 100 000 in women respectively for Uganda, Kyadondo and India, Karunagappally). Our results can be interpreted as, in Izmir for 1998- 2002 the kidney cancer rates especially amongst men was lower than expected considering that cigarette smoking has consistently been observed to be a risk factor for kidney cancer. In fact, cigarette smoking and obesity are the most consistently established causal risk factors, accounting for more than 20% and 30% of renal cell cancers, respectively (Van Poppel et al., 2000; Lipwoth et al., 2006; McLaughlin et al., 2006). In addition, hypertension history has also been consistently linked to kidney cancer (McLaughlin et al. 1995; Yuan et al., 1998; Chow et al., 2000; Grossman et al., 2002; Flaherty et al., 2005; Lindgren et al., 2005). The attributable risk of reported hypertension has been estimated to be 21% overall (Benichou et al., 1998). There is also a substantial proportion of kidney cancers related to diabetes (Wideroff et al., 1997; Lindblad et al., 1999). Acquired cystic kidney disease (i.e. kidney stones and kidney infections) is another factor linked with the development of kidney cancer (Lindblad and Adami, 2002). However, it seems unlikely that the known risk factors can explain the very large disparities in kidney cancer incidence that occur between different populations, and further important causes of renal cancer are likely to exist (Scelo and Brennan, 2007). Concurrently, autopsy practice in Turkey which is applied for only suspected deaths and possible under diagnosis of some cases might be implicated for the low rates.

Annual incidence rates of kidney cancer increased with age up to the age of 75 and there was a decrease in the incidence rates after that age both in males and females. The age pattern is the similar with the general aspects of the age distribution of kidney cancer, except for the fact that generally incidence rates reach a plateau at 75 years of age (Curado 2007).

Nevertheless, incidence rates of kidney cancer among men show an increasing trend in Izmir (ASR: 2.3 per 100 000 for 1993-1997; 3.3 per 100 000 per 1998-2002) as in the other parts of the world. In the United States, the rates have been rapidly increasing among black Americans, whose incidence rate has now surpassed that of white Americans (McLaughlin et al., 2006). From 1983 to 2002, the overall age-adjusted incidence rate for kidney cancer rose from 7.1 to 10.8 cases per 100 000 in US populations.

Testicular cancer was the most common urological cancer among men aged 15-34 years. The age-adjusted

incidence rates varied 10-fold across populations with the highest rates in Scandinavia (Denmark 9.9 per 100 000) and the lowest in Harare, Zimbabwe (0.4 per 100 000). High testis cancer rates also occurred among populations of Europe (Bas-Rhin region of France 7.9), Oceania and North America (U.S. white and Ontario populations 5.6 and 4.4 per 100 000, respectively), whereas low rates were evident in Latin American, Asian and African populations, including U.S. blacks (1.0) (Purdue et al., 2005). The causes of this variation are not known. An association with cryptorchidism seems to be elevating these incidence rates.

In conclusion, bladder cancer incidences in Izmir were quite high especially for men and continue to increase. Prostate cancer had lower incidence rates in comparison to Western countries but it has an increasing trend. Low incidence rates for kidney cancer were also observed. However, there might be a slight underestimate of incidences, owing to an inability to use data from death certificates. Even so, the overall profile is an accurate reflection of incidence in this region of Turkey and provides adequate information for planning strategies to cancer prevention. It is obvious that the most crucial intervention to be put into practice in Izmir will be to carry on well-organized tobacco control programs under the frame of the recent regulations (act no: 5727 date of acceptance: 3/1/2008) for the tobacco control law which have been in force since 1996 (act no: 4207, date of acceptance 7/11/1996) (<http://www.ssuk.org.tr/MveB.php>) in the country.

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