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## Mini Review

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### Five Common Cancers in Iran

Shadi Kolahdoozan MD MPH\*, Alireza Sadjadi MD MPH\*\*, Amir Reza Radmard MD\*\*\*,  
Hooman Khademi MD MPH\*

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Iran as a developing nation is in epidemiological transition from communicable to non-communicable diseases. Although, cancer is the third cause of death in Iran, it's mortality are on the rise during recent decades. This mini-review was carried out to provide a general viewpoint on common cancers incidence in Iran and to explain incidental differences that may help us to establish early detection programs and investigate population risk factors.

A detailed PubMed, Scopus and Google scholar search were made from 2000 to 2009. The basic inclusion criteria were all relevant studies focused on cancer epidemiological data from Iran.

Overall age-standard incidence rate per 100 000 population according to primary site is 110.43 in males and 98.23 in females. The five most common cancers (except skin cancer) are stomach, esophagus, colon-rectum, bladder and leukemia in males, and in females are breast, esophagus, stomach, colon-rectum and cervix uteri.

The incidence rates of gastrointestinal cancers are high in Iran (it is one of the known areas with a high incidence of GI cancers). Breast cancer mainly affects Iranian women about a decade earlier than Western countries and younger cases are affected by an increasing rate of colorectal cancer in Iran, near the Western rates.

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#### Introduction

Iran, which is located in southwest Asia, is in an epidemiologic transition and faces the double burden of diseases. The demographic and epidemiological transition that is underway will have a significant impact on the pattern of morbidity and mortality in the near and distant future, especially as it affects the emergence of chronic non-communicable diseases, health problems of an aging population and road traffic injuries. In addition, cancer is a major public health problem in Iran. Based on recent reports

from the Ministry of Health and Medical Education (MOHME)<sup>1,2</sup>; it is the third cause of death in Iran after coronary heart disease and accidents.

Unfortunately, few national programs according to the World Health Organization (WHO) guidelines for cancer screening and prevention are active in Iran,<sup>3</sup> such as those for colon and gastric cancer. The goals of the first attempts to establish a cancer control program has been followed through prevention, early diagnosis, effective treatment, and palliative care programs; all of which are entire parts of preventing cancer and providing an appropriate care for cancer patients. The target population in this program is not limited to any particular class, age, sex, ethnic, or racial groups. Despite these approved programs, there are many problems: the financial burden of different types of treatment, the advanced stage at presentation of cancer patients, as well as inadequate medical staff training for diagnosis, treatment, palliative care, and psychological care of cancer patients.<sup>3</sup> Therefore, it seems that

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**Authors' affiliations:** \*Digestive Disease Research Center, Tehran University of Medical Sciences, Tehran, Iran, \*\*Department of Epidemiology, University Medical Center Groningen, Groningen, The Netherland, \*\*\*Department of Radiology, Shariati Hospital, Tehran University of Medical Sciences, Tehran, Iran.

**Corresponding author and reprints:** Hooman Khademi MD MPH, Digestive Disease Research Center, Tehran University of Medical Sciences, North Kargar Ave., Shariati Hospital, 14117-13135 Tehran, Iran.

Tel: +98-21-824-14-824-150-00, Fax: +98-21-824-154-00

E-mail: khademi@ddrc.ac.ir

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maximizing web-based systems for communication, education, and collaboration between organizations are needed.<sup>3,4</sup>

In 1984, the Iranian Parliament passed a bill mandating that physicians and pathology centers report all cancer cases according to the International Classification of Diseases-Oncology (ICD-O) to the Ministry of Health.<sup>5</sup> In practice, the principal sources of cancer registries are hospital records and records from diagnostic departments, in particular histopathology.<sup>6</sup> When possible, death certificates in which cancer is included as a main or contributory cause of death are also used. In Iran, the National Cancer Registry (NCR) which is only a pathology report band as well as population-based cancer registry reports from five provinces (Kerman, Golestan, Mazandaran, Ardabil, and Tehran) are the most important sources of collecting information.<sup>5,6</sup>

Information related to data collection from different cancer registries have been published in various articles. For example A Sadjadi et al.<sup>7</sup> in 2005 concluded that the five most common cancers in males [by age-standardized incidence rate (ASR)] were stomach (26.1 per 105), esophagus (17.6), colon-rectal (8.3), bladder (8.0) and leukemia (4.8); and in females, breast (17.1), esophagus (14.4), stomach (11.1), colon-rectal (6.5) and cervix uteri (4.5) were the most common cancers. In addition, these data have suggested that the incidence rates of esophageal and stomach cancers in Iran are well above the world average, while the incidence of lung cancer was very low. Another survey by SM Mousavi et al.<sup>6</sup> concluded that the ASR of cancers was 98 and 110 per 100,000 among females and males, respectively. The male to female ratio was 1:1.2. The most common cancers among women and men were breast cancer (24) and stomach cancer (15), respectively. The estimated mortality rate for cancer was 41.1 and 65 per 100,000 for females and males in 2004.

Therefore, in Iran, the top five cancers in both sexes (stomach, esophagus, breast, prostate and colon) are described below.

### Gastric cancer

In Iran, most northern and north western areas are at high risk for gastric cancer, whereas the central and western provinces are at medium risk and the southern regions are at a low risk.<sup>8</sup> Ardabil, a north western province, has the highest incidence of gastric cancer in Iran with an ASR of 49.1 and

25.4 in men and women, respectively.<sup>8</sup> The provinces of Semnan, Golestan, and East Azerbaijan as well as the Tehran metropolitan area also have high rates of gastric cancer in both men and women. In contrast to the northern areas, Kerman, a province in the south, shows a lower incidence rate of gastric cancer with an ASR of 10.2 and 5.1 in men and women.<sup>7,8</sup> It is important to know that the higher incidence rate of gastric cancer in Ardabil is due to higher rates of gastric cardia rather than non-cardia cancer, with an incidence of 26.4 and 8.6 in men and women, respectively.<sup>8,9</sup>

On the other hand, SM Mousavi et al.<sup>6</sup> have indicated in their report (based on pathology reports) that the 2005 – 2006 incidence rates of gastric cancer were 15.21 and 8.89 in men and women, respectively. This contrasts other high-risk areas, for example Japan where non-cardia cancer remains as a major form of gastric cancer. The proportion of non-cardia to cardia cancer in low risk areas of Iran such as Khuzestan, south west Iran is high at approximately 85%. A recent study by Abdi-Rad et al.<sup>10</sup> has shown that the proportion of people with proximal gastric cancer as compared to those cancers located in the mid and distal third of the stomach in the capital of Iran, Tehran, is increasing. Many environmental factors including smoking, high salt intake, and a diet with an insufficient level of antioxidants are involved in the pathogenesis of gastric cancer.<sup>8</sup>

### Esophageal cancer

The north and north east regions of Iran are some of the known areas that have a high incidence of esophageal cancer.<sup>11,12</sup> In one early survey by the Iran Cancer Institute, 9% of all cancers and 27% of gastrointestinal cancers were esophageal carcinoma with a male to female ratio of 1.7:1.<sup>13</sup> Golestan Province in northeastern Iran is one of the higher risk areas of the world, followed by Mazandaran and Khorasan Provinces.<sup>12</sup> As with most other areas of the world, squamous cell cancers constitute >90% of all esophageal cancers in northeastern Iran.<sup>12</sup> Mousavi et al.<sup>6</sup> has concluded that the incidence rate of esophageal cancer during 2005 – 2006 was 5.83 and 6.25 in males and females, respectively.

Several risk factors have been investigated as possible etiologic factors for esophageal squamous cell carcinoma in north eastern Iran,<sup>14–16</sup> but very few have been shown to be associated with this disease.<sup>17</sup> Earlier studies in Golestan have

suggested that a low intake of fresh fruits and vegetables, low socioeconomic status, and opium consumption are associated with a higher risk of esophageal cancer.<sup>14</sup> In addition, studies have pointed towards the possible role of drinking very hot tea.<sup>14</sup> In other words, recurrent thermal injury to the esophageal mucosa due to consumption of large amounts of hot drinks has long been suspected to be a risk factor for esophageal cancer. Public education, nutritional support, and eradication of opium addiction may decrease the morbidity and mortality that result from esophageal cancer.<sup>13</sup>

### **Breast cancer**

In Iran, breast cancer ranks first among cancers diagnosed in women,<sup>7</sup> comprising 24.4% of all malignancies with a crude incidence rate and ASR of 17.4 and 23.1 (23.65 in a Mousavi report) per 100,000, respectively.<sup>6</sup> Abundant data on the features of breast cancer are available from industrialized countries, but unfortunately studies that report the clinico-pathological features, stages and age distribution of this disease in Iran are rare.<sup>18-20</sup> Therefore it is problematic to predict future patterns and perform the most appropriate preventive and therapeutic modalities in order to decrease the burden of this disease in society. The few small studies and reports available in Iran suggest that breast cancer affects Iranian women at least one decade younger than women in developed countries, with the mean age ranging from 47.1 to 48.8 years.<sup>18</sup> The first report<sup>21</sup> on the incidence and age distribution of breast cancer in Iran has used population-based data extracted from a cancer registry which covered five provinces (Gilan, Mazandaran, Goelstan, Ardabil, and Kerman) during a period of five years (1996 – 2000). Overall, 2421 cases of breast cancer have been documented during the study period. This study has demonstrated that the ASR of breast cancer is low (17.1 per 100,000 person-years), as in most Asian countries whose ASRs are 20.6, 21.8 and 33.3 for Eastern, South-Central and Western Asia, respectively. We should mention that cancer registries should be established to cover a broader spectrum of the population and further studies are needed to map out the exact breast cancer incidence rate and trends over time in order to determine possible environmental, lifestyle and/or genetic risk factors in Iran.<sup>18,20</sup>

### **Prostate cancer**

Relatively little is known about the

epidemiology of prostate cancer in Iranian men. One study from the first report of cancer incidence in Tehran<sup>22</sup> shows that prostate cancer is the second most common cancer among men in Tehran, after stomach cancer, with an ASR of 15.6. According to the results of another report<sup>23</sup> which has been based on data obtained from cancer registries covering five provinces during the five year period of 1996 to 2000, the ASR of this cancer has been calculated to be 5.1 (9.41 in a Mousavi report during 2005 – 2006) per 100,000 person-years. The age incidence curve of prostate cancer in Iran shows a slow rise with increasing age (after 50 years of age). Hence, the age distribution of prostate cancer in Iran is similar to that of other countries. It seems future investigations are needed to improve our knowledge about the exact state of prostate cancer in Iran and its trends over time. Therefore, expansion of our cancer registry system is necessary in order to identify the true incidence of prostate cancer and its probable geographic disparities in Iran.<sup>23</sup>

### **Colon cancer**

Since the information regarding colon cancer (CC) in Iran is limited, previous studies on CC in Iran<sup>24-26</sup> have demonstrated a very low prevalence, particularly for older individuals and a younger age distribution has been suggested in comparison to Western reports, therefore the burden of this disease will increase dramatically in the near future. It also has some well known hereditary forms.<sup>24</sup>

The first report on cancer occurrence in Iran published by A Sadjadi et al.<sup>23</sup> has demonstrated that CC is the third most common cancer amongst males (ASR: 8.19 – 8.3) and the fourth amongst females (ASR: 6.5 – 7.56). The result of another survey from R Ansari et al.<sup>27</sup> regarding incidence and age distribution of colorectal cancer in Iran based on the population-based cancer registry has shown that the ASRs of CC in Iran are between 7 and 8 per 100,000 in both men and women, which are higher than previously reported rates. These incidence rates are close to those reported from other middle-eastern countries and much lower than those seen in western countries. On the other hand, the high frequency of a positive family history of CC in Iranian patients<sup>24</sup> indicates that a significant number of CC in Iran arise in immediate family members and other relatives of CC patients.

In spite of these scientific progresses, the rate of screening is very low globally and negligible in both Iran and many other developing countries. This is due to cost, resistance by physicians, patients, and the healthcare system.<sup>28</sup> In Iran, screening should at least be started in family members of CC patients at an earlier age with colonoscopy as the preferred screening modality.<sup>25</sup>

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