



## The Incidence of Breast Cancer in Northwest Iran (2003 -2008)

Shahryar Hashemzadeh<sup>1</sup>, Raheleh Aligholipour Maleki<sup>2\*</sup>, Samad EJ Golzari<sup>3,4</sup>

<sup>1</sup>Department of Thoracic Surgery, Tabriz University of Medical Sciences, Tabriz, Iran

<sup>2</sup>Tuberculosis and Lung Disease Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

<sup>3</sup>Medical Philosophy and History Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

<sup>4</sup>Students' Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran

### ARTICLE INFO

#### Article Type:

Research Article

#### Article History:

Received: 12 Dec 2011

Accepted: 19 Jan 2012

ePublished: 17 Feb 2012

#### Keywords:

Breast Cancer  
Incidence  
Iran

### ABSTRACT

**Introduction:** Breast Cancer is the most common cancer in Iranian women and Iranian patients are relatively young. Given that Iran has a female population of about 38 million, this corresponds to a total number of 6000 new cases of breast cancer annually. This study aims to demonstrate the characteristics of breast cancers according to pathologic records in East Azerbaijan province, Iran. **Methods:** In this retrospective cross-sectional study, 159314 pathology records of the main hospitals and pathology laboratories were observed for a period of 5 years. For each patient, sex, age, breast specimen pathology, pathological grading of malignant lesions and place of residence of patients were collected and statistically analyzed. **Results:** There were 12083 cancer cases; 902 of which were primary breast cancer. Breast cancer was the most common cancer in females (22.2%) but it ranks the 22<sup>nd</sup> in males. The annual incidence of breast cancer in women was 52.3 per 100,000. The mean age of women with breast cancer was 48.3±12.7 years (range, 16-85) and for male 54.0±13.6 years (range, 23-76). The highest frequency of malignancies was observed in the 40-49 year old age groups (34.5%). Invasive ductal carcinoma was the most common histological type diagnosed in both sexes. **Conclusion:** In Iran, breast cancer affects women at least one decade younger than developed countries. In spite of the rare incidence of breast cancer in men, the descriptive epidemiology of this malignancy is surprisingly similar to that of women. A considerable proportion of cancers of our research were in breast which mandates a national cancer detection program encouraging women for breast self-examination and participation in screening tests to improve breast cancer care.

### Introduction

Cancer is a major public health concern in most developed countries. Currently, one in four deaths in the United States is reported to be due to cancer. A total of 1479350 new cancer cases and 562340 deaths for cancers were reported in the United States in 2009.<sup>1,2</sup> Based on data from 2005-2007, 40.77% of men and women born today will be diagnosed with cancer of all sites at some time during their lifetime.<sup>2</sup>

For almost 30 years no population-based cancer statistics have been performed based on which to estimate the cancer burden in Iran.<sup>3</sup> However, a few studies have been conducted trying to map out cancer incidence rates in different areas of Iran.<sup>4,5</sup>

According to recent statistics issued by the Ministry of Health, cancer is the third most common known cause of death in Iran, following cardiovascular diseases and accidents. In recent years, national health officials and

researchers in the field of cancer are demanding for reliable cancer incidence data.<sup>6</sup>

Defining medical treatment and screening of high risk groups while mapping out the risk of cancers would only be achieved by adequate information on different types of cancers in different geographic areas. Therefore, several research centers focus on cancer research in Iran. The total population of East Azerbaijan Province, according to the 2006 census, is 3603456 (1,839,352 = male 1,764,104=female). Life expectancy is 68.61 years for males and 71.37 years for females. More than fifty percent of the population is younger than 25 years. Tabriz is the largest city in northwest Iran with a population of 1,579,312 people (2006 est.).<sup>7,8</sup>

We aimed to obtain cancer incidence data from the whole province, to select the target populations and hot spots for our future cancer field studies. The project began with active surveillance for all cancer cases and

\*Corresponding author: Raheleh Aligholipour Maleki, E-mail: ra.yas74@yahoo.com

the establishment of a population-based cancer registry in this province.

### Materials and methods

The Cancer Registry office is located in Tabriz, the capital city of East Azerbaijan Province. This registry is run by Tabriz University of Medical Sciences. The Medical Ethics Committee of Tuberculosis and Lung Research Center (TLRC) of Tabriz sponsored and approved the survey methods. The survey team had been trained to go to the province hospitals and pathology laboratories to check records for cancer cases and, whenever possible, to make a copy of the documents, based on which a diagnosis of cancer had been made. These were then sent to the registry office in Tabriz.

During a period of 9 months (2010), the survey team actively collected and compiled data for a period of 5 years (2003-2008) from 8 hospitals and 9 private pathology laboratories in Tabriz and 5 main cities of East Azerbaijan province (Mianeh, Marand, Bonab, Ahar and Maragheh). Copies of the pathology records were made and sent to the registry office.

The data were summarized in a data sheet. After data collection had been completed, all data were alphabetically organized and duplicate cases with the same name, sex, age and place of residence were eliminated manually and by computerized linkage. Data was sorted alphabetically using a computer and identical cases were excluded from the list.

The data were analyzed using SPSS (SPSS Inc., Chicago, IL, USA) software, version 15. We calculated person-years of the population at risk using each year method. The results are presented as incidence rates of cases by site International Classification of Diseases (ICD-10), sex, age (mean  $\pm$  SD) and Age-Specific (crude) incidence rate by sex and site and Age-Adjusted incidence rate per 100,000 person-years, using the direct method of standardization to the world standard population.<sup>2</sup> Statistics were generated from primary malignant cases only.

The world standard population was chosen because it is more similar to the resident population than other standards (e.g. the World or US 1970 ones). The world standard has a greater percentage of younger subjects (48%  $\leq$  25 years old) and a lower percentage of older subjects (60+ years), with 11% population. The use of such a standard gives more weight to the events in the younger population.

The well-trained survey team had access to all patient records in East Azerbaijan. These data are the most complete and accurate estimate of cancer occurrence that have ever been reported from East Azerbaijan. The survey team obtained a copy of pathologic documents in

the majority of cases; and the epidemiologist and pathologists were able to recheck the information, specifically to exclude benign or suspicious cases and to reclassify the cancers as necessary.

One of the shortcomings of our study was its retrospective nature in the setting of poor-quality medical records kept in private and public hospitals and other medical centers. In addition, not using the ICD coding system in some of the medical centers at the time of diagnosis made it impossible to classify all cancer cases.

### Results

Over a 5-year period (2003-2008), 159314 pathologic reports were observed in hospital and private centers in East Azerbaijan province; 12083 of which were cancer cases. 10717 of the cancer patients were East Azerbaijan residents and 748 cases were of the other regions. Non-melanoma cancers of the skin (Basal Cell Carcinoma [BCC], Squamous Cell Carcinoma [SCC] & Basoosquamous cell cancer) and in situ carcinomas (except for urinary bladder) were excluded and 9166 cases were classified to 4 anatomical sites: head and neck, thorax, limbs (bone and muscle, skin, soft tissue, lymph node), abdomen (gastrointestinal tract, genitalia and retroperitoneum and urinary system). (Table 1)

Of 9166 cancer cases in total, 5252 (57.3%) were male and 3602 (42.6%) female and 12 (0.1%) undefined sex. The mean ( $\pm$ SD) age at the time of first diagnosis was 60.07  $\pm$  17.02 years for males and 52.29  $\pm$  17.03 years for females. The top 7 cancers in males were stomach (18.2%), bladder (16.6%), esophagus (12.3%), lung and bronchus (7.2%), prostate (6.4%), colon and rectum (5.7%) and brain (5.5%); in women, these were breast (22.2%), esophagus (13.8%), stomach (9%), thyroid (7.9%), brain (7%), colon and rectum (6.6%) and bladder (4.5%). Distribution of cancers of the thorax by sex is shown in Table 2.

Breast and thyroid cancers in females and lung cancers in males were the most common cancers of the thorax. Age-adjusted cancer incidence rates (per 100000) for cancer of breast are shown in Figure 1,2. Age-specific (crude) incidence rates in 7 age-groups for breast cancers are calculated and shown in Table 3 and 4; male to female ratio and mean age  $\pm$  standard deviation for all cancers of thorax were shown in Table 5.

The most common cancer of the breast was invasive ductal carcinoma consisting of 95.6% (3.4% in male and 92.1% in female) of the all cancers of breast, followed by invasive lobular carcinoma (4.1%). Mean age of the patients with breast cancer was 64.55 $\pm$ 11.94 years (with the age range of 1-97 years).

**Table 1.** Anatomical sites and number of all cancers in East Azerbaijan, Iran (2003-2008)

Anatomical site	No. of cancers (%)
Head and Neck	1432(15.6)
Thorax	1865(20.3)
Abdomen:	
GI tract	3365(36.7)
Urinary system	1233(13.5)
Genitalia	705(7.7)
Limbs	566(6.2)
Total	9166(100)

**Table 2.** Distribution of cancers in thorax

site	male		female		total	
	frequency	percent	frequency	percent	frequency	percent
Breast	34	1.8	868	46.5	902	48.4
Lung	380	20.4	89	4.8	469	25.1
Thyroid	120	6.4	311	16.7	431	23.1
Mediastinum	17	0.9	16	0.9	33	1.8
Pleura	10	0.5	8	0.4	18	1
Trachea	5	0.3	2	0.1	7	0.4
Cardiac	0	0.0	2	0.1	2	0.1
Pericardium	1	0.1	1	0.1	2	0.1
Parathyroid	1	0.1	0	0.0	1	0.1
total	568	30.5	1297	69.5	1865	100

**Table 3.** Age-specific (crude) incidence rates per 100000 person-year by age groups in female in East Azerbaijan, Iran (2003-2008)

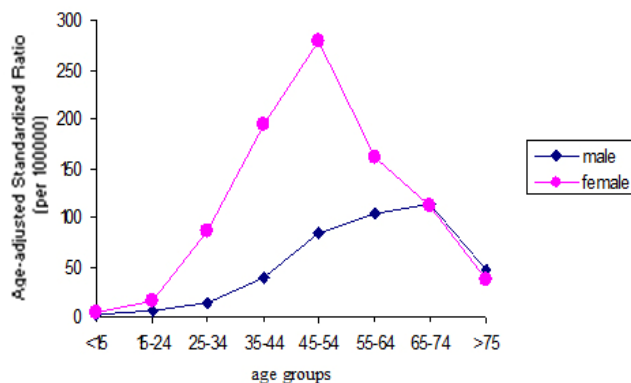
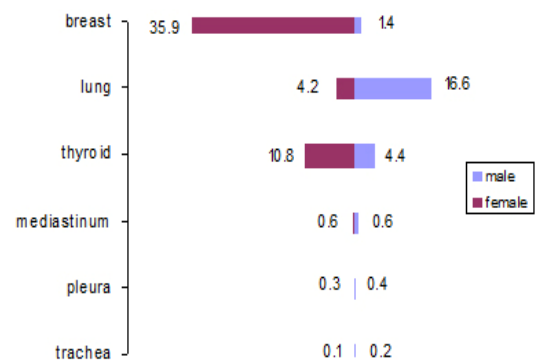
Site	<15	15-24	25-34	35-44	45-54	55-64	≥65
All cancers but skin	13.3	36.6	119.3	295.1	587.2	836.8	1150.7
All thorax cancers	1	8.4	60.9	161.3	252.4	199.9	212.2
Breast	0	1.2	35.5	120.6	195.7	136.9	125.9
Lung	0	0	1.8	4.1	15.5	24.9	37.4
Thyroid	0.4	6.3	22.8	35.6	33.4	35.7	43.1

**Table 4.** Age-specific (crude) incidence rates per 100000 person-year by age groups in male in East Azerbaijan, Iran (2003-2008)

Site	<15	15-24	25-34	35-44	45-54	55-64	≥65
All cancers but skin	13.3	36.6	119.3	295.1	587.2	836.8	2514.8
All thorax cancers	0.8	3.5	10.4	31.9	75.9	129.8	229.5
Breast	0	0.2	0.4	3.5	4.7	10.5	8.2
Lung	0	0.9	2.6	11.1	46.9	97.1	198.7
Thyroid	0.4	1.1	7.1	11.1	20.4	17.5	18.4

**Table 5.** Male to Female Ratio and mean age  $\pm$  standard deviation for common sites of thorax cancers in East Azerbaijan, Iran (2003-2008)

Site	Common age group		M/F ratio	Mean age $\pm$ SD	
	male	female		male	female
All cancers	45-54	65-74	1.34	60.1 $\pm$ 17.0 (0-120)	52.3 $\pm$ 17.0 (1-101)
All thorax cancers	65-74	45-54	0.45	57.7 $\pm$ 15.4(2-88)	47.8 $\pm$ 14.4 (5-97)
Breast	55-64	45-54	0.04	54.1 $\pm$ 13.6 (23-76)	48.3 $\pm$ 12.8 (16-85)
Lung	65-74	65-74	4.25	62.5 $\pm$ 12.5 (19-88)	58.2 $\pm$ 13.8 (26-97)
Thyroid	45-54	35-44	0.39	47.1 $\pm$ 15.8 (12-81)	43.4 $\pm$ 16.3 (12-88)

**Figure 1.** Age-adjusted Standardized Ratio (ASR) of all thorax cancers in East Azerbaijan, Iran (2003-2008)**Figure 2.** Age-adjusted cancer incidence rates (per 100000) for common cancers of thorax, by sex in East Azerbaijan, Iran (2003-2008)

## Discussion

Studies on cancer epidemiology in developing countries such as Iran and information on cancer prevalence is either absent or largely unavailable for Iran. The aim of this work was to estimate the prevalence and incidence of all cancers in East Azerbaijan; report of breast cancers is a part of this study in this area. Based on the recent standardized rates, cancer is almost 9 times and 7 times more frequent among the elderly compared with younger men and women. The highest incidence of cancers was in group 75-79 years in both genders and then a decline was observed as age increased.<sup>1</sup>

We conducted a retrospective epidemiological study in northwest Iran to assess the prevalence, incidence and histological types of cancers classifying the cancers of thorax in 4 parts (breast, lung, thyroid & the other uncommon sites). This paper is a part of our study.

### Cancer of breast

Despite the fact that breast cancer has been reported as the most common fatal cancer in females worldwide, an immense lack of population based studies exists in our region (northwest of Iran). It is estimated that 207,090

women will be diagnosed with and 39,840 women will die of breast cancer in 2010. From 2004-2008, the median age at diagnosis for breast cancer was 61 years. In Asia, The age-adjusted incidence rate was 124 per 100,000 women (93.7 in Asian women) per year; Surveillance, Epidemiology, and End Results SEER data from 1975-2008 suggested that this incidence is decreasing.<sup>2</sup> Breast cancer is the most common cancer among women worldwide.<sup>9</sup> Among women in the USA, breast cancer remains the most commonly diagnosed cancer, excluding skin cancers, and the second leading cause of cancer-related death.<sup>10,11</sup> In Iran, breast cancer affects women at least one decade earlier than their counterparts in developed countries.<sup>12</sup> Early detection of breast cancer has always been an important challenge to health professionals worldwide. According to the World Health Organization's recommendations on implementing national cancer control programs<sup>13</sup>, assessment of the magnitude of the cancer problem (i.e., incidence, prevalence, and mortality) is the first prerequisite in this process. Breast cancer accounted for 25.5% of all female cancers with a crude incidence rate of 22.4% in 100,000 in Tehran in 1998.<sup>14</sup> The National

Cancer Registry reported 1,603 new cases of breast cancer in 2000, 3946 new cases in 2003, and 4557 new cases in 2004.<sup>15</sup>

Two screening programs and a cross-sectional study showed a prevalence rate of 352 per 100,000 for breast cancer in women aged 30–65 years in Bushehr in 1998<sup>16</sup> and 660 per 100,000 for women 35 years and older in Shiraz in 1997.<sup>17</sup>

The incidence rate of breast cancer in women over 30 in Iran is 22 per 100,000. The prevalence rate however is 120 per 100,000. Our five year study from northwest Iran showed that breast cancer was the most common cancer of thorax in female with an annual ASR of 35.9 per 100000; and for males 1.4 per 100000. This first report from East Azerbaijan suggests a need for future evaluations to map out the risk factors and interventions. Invasive Ductal carcinoma was found to be the most common (92.1%) and lobular carcinoma the least (4.1%). A literature review of the published articles from 1998 to 2005 showed that the most prevalent age of breast cancer was 40-49 years old, the incidence and prevalence in women were 22 and 120 per 100000 and infiltrative ductal carcinoma was found to be the most common (77%) and lobular carcinoma the least (5%). They indicate that the epidemiological aspects of breast cancer in Iran are relatively well-studied and shortcoming in study of its clinical aspects needs to be a main part of investigations in the future.

Recent studies suggest that overall relative survival rate in Iranian breast cancer patients stands between western and eastern European countries requiring to be improved. Early detection and better management using standard guidelines would contribute considerably to improvement of survival in women experiencing breast cancer.

### Conclusion

Our study had some limitations including many incomplete charts and lacking data, bias and the accuracy of the data in patients' charts.

The overall cancer incidence in the northwest of Iran was similar to the national incidence in Asia. Further studies focusing on risk factors of breast cancers and patterns of breast cancer incidence are however required to reach more solid conclusions.

Observing countries in central Europe, one would conclude that high cancer prevalence accompanies well-developed economies. Several parameters might contribute to this phenomenon including higher proportion of elderly people, lower general mortality, more frequent early detection and high expenditure on health care. This increased burden of cancer could be interpreted as a paradoxical effect of improving treatments and thereby survival. Furthermore, this could be an indication of advances in treating patients

diagnosed with cancer and more available support for primary prevention.

*Conflict of interests:* The authors declare no conflicts of interest

### References

1. Jemal A, Siegel R, Ward E, Hao Y, Xu J, Thun MJ. Cancer statistics, 2009. *CA Cancer J Clin* 2009; 59: 249-55.
2. Howlander N, Noone A, Krapcho M, Neyman N, Aminou R, Waldron W. SEER Cancer Statistics Review, 1975-2008, National Cancer Institute. Bethesda, MD. 2011.
3. Sadjadi A, Nouraei M, Mohagheghi MA, Mousavi-Jarrahi A, Malekezadeh R, Parkin DM. Cancer occurrence in Iran in 2002, an international perspective. *Asian Pac J Cancer Prev* 2005; 6:359-63.
4. Habibi A. Cancer in Iran. A survey of the most common cases. *J Natl Cancer Inst* 1965;34: 553-69.
5. Sadjadi A, Malekzadeh R, Derakhshan MH, Sepehr A, Nouraei M, Sotoudeh M, et al. Cancer occurrence in Ardabil: Results of a population-based Cancer Registry from Iran. *Int J Cancer* 2003; 107: 113-8.
6. Mosavi-Jarrahi A, Mohagheghi MA, Zeraati H, Mortazavi H. Cancer registration in Iran. *Asian Pac J Cancer Prev* 2001;2: 25-9.
7. Iran chamber (accessed April 2012), Available at: <http://www.iranchamber.com/cities/tabriz/tabriz-php>
8. Wikipedia (accessed April 2012), <http://en.wikipedia.org/wiki/tabriz#culomn-one>
9. WHO. Screening for Breast Cancer (accessed April 2012). <http://www.who.int/cancer/detection/breastcancer/en/>
10. Kwan ML, Kushi LH, Weltzien E, Maring B, Kutner SE, Fulton RS, et al. Epidemiology of breast cancer subtypes in two prospective cohort studies of breast cancer survivors. *Breast cancer Res* 2009; 11:R31.
11. American Cancer Society: Cancer facts and figures 2008. Atlanta: American Cancer Society; 2008.
12. Harirchi I, Karbakhsh M, Kashefi A, Momtahan AJ. Breast cancer in Iran: results of a multi-center study. *Asian Pac J Cancer Prev* 2004; 5:24-7.
13. WHO Model for Cancer Control,( Accessed June 20, 2006). <http://www.ispt.ro/supercourse/lecture/lec0701/020.htm>.
14. Harirchi I, Ghaem-Maghani F, Karbakhsh M, Moghimi R, Mazaheri H. Patient delay in women presenting with advanced breast Cancer, a study from Iran. *Public Health*. 2005; 119:885-91.
15. Goya M. Iranian Annual Cancer Registration Report 2003. Ministry of Health and Medical Education, Health Deputy, Center for Disease Control and Prevention. March 2005 [Persian].
16. Assadi K, Ovjee MR, Vahdat S, Shams S, Hghshenas M, Poursalimi SH. Breast cancer screening in Bushehr port population aged 30-65 years. *South Med J* 1998; 1:217-22.
17. Talei AR, Sadeghi-Hassanabadi A, Saalabian J. A Preliminary Report on Breast Cancer Screening Program in Shiraz Southern Iran. *Iran J Med Sci* 1997; 22:148.