

# Demographic Features of Common Cancers in the National Cancer Institute, Misurata

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## ABSTRACT

**Background:** The epidemiological data of cancer cases provides vital scientific information to evaluate and estimate the burden of the disease in Libya.

**Patient and Methods:** A hospital-based registry of cancer was used to document the facts of 974 Libyan patients with different cancers, diagnosed at the National Cancer Institute, Misurata-Libya in the year of 2016.

**Results:** Of the 974 cancer patients, 538 were females with a mean age of 53 years. The number of male cancer patients was 436 men, with an average age of 57.7 years. The data revealed that the most common types of cancer in women were breast (n = 222; 41.3%), colon (n = 69; 12.8%), lymphoma (n = 32; 5.9%), ovarian (n = 31; 5.8). %). and uterus (n = 27; 5%). On the other hand, the most common cancers in men were colon (n = 80; 18.3%), lung (n = 80; 18.3%), prostate (n = 55; 12.6%), lymphoma (n = 42; 9.6%), and leukemia (n = 22; 5%).

**Conclusion:** To improve the cancer registry, it is necessary to have well-developed sources of epidemiological and clinical data in order to determine the cancer's prevalence and assess any new instances. Second, data on cancer should be shared and used in Libya to enhance cancer management.

## Introduction

Cancer is a collection of disorders defined by uncontrolled cell growth and spread. Cancer is becoming more common over the world as a result of an aging population and environmental conditions [1]. Cancer is becoming more prevalent in Africa as the population grows and develops, as well as the increased prevalence of risk factors associated with economic transition (such as smoking, alcohol, obesity, junk food, physical inactivity, and reproductive behaviors) and certain infectious agents that play a role in disease etiology [2]. According to the United Nations, Africa's population is expected to grow from 1.03 billion to 1.63 billion between 2010 and

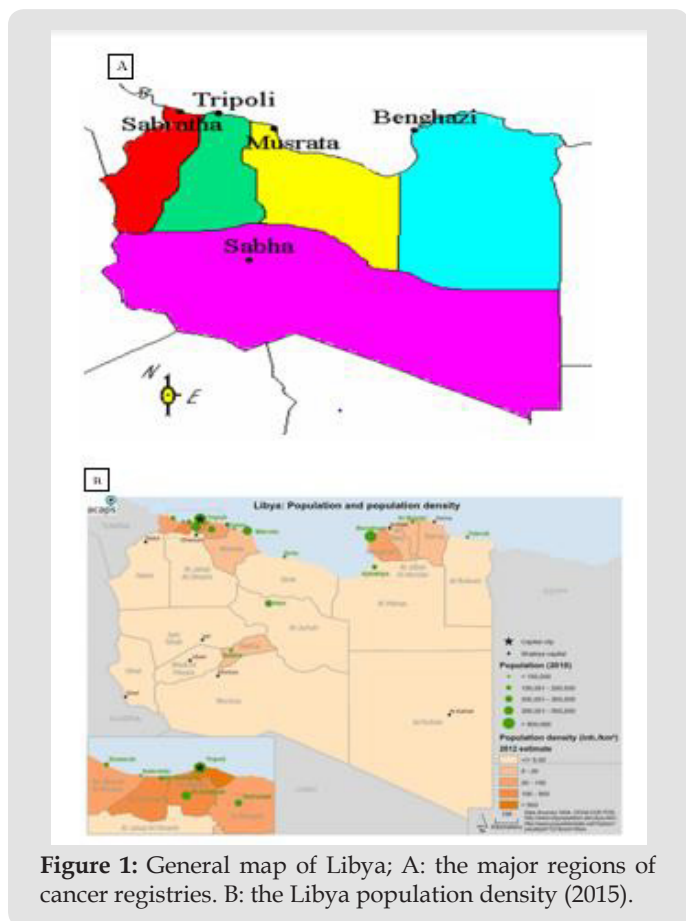
2030, with a growth rate of around 60%, and by 90% for those aged 60 and over, as the population in this age group is expected to grow from 55 million to 103 million, on the other hand, this is the age when most tumors occur [2]. The global burden of cancer continues to rise, owing mostly to population aging and expansion, as well as cumulative exposure to carcinogenic activities, particularly smoking, in economically developing countries. Despite the fact that cancer incidence in the developing world is around half that in the developed world, overall cancer mortality is often comparable [3,4].

Cancer survival is worse in underdeveloped nations, most likely due to a combination of late-stage detection and limited access to appropriate and standard health care [5]. Accurate data is required for proper strategic planning and strategy to scaling up health care services such as screening, prevention, early diagnosis, and treatment. As a result, cancer registries were established, which are used to determine the incidence and prevalence of cancer as a first step toward developing a national cancer prevention and treatment plan [6]. Because of a lack of cancer monitoring and screening methods, comprehensive studies in the field of cancer epidemiology are limited in developing nations. Due to the lack of a national cancer registry, the Libyan picture is further complicated by the lack of a defined system for capturing data and restricted monitoring for the formation of strategic plans for the health care program [7-9]. Libya was separated into five sections when the Ministry of Health began implementing a cancer registry program in 2007 (Figure1A).

of more than a million people [1]. The current study's goals are to assess some demographic data, cancer rates, and prevalence based on the hospital cancer registry at the National Cancer Institute-Misurata. The research could help to improve cancer control in the country as a whole. This is the first-time statistics on the prevalence of cancer in Libya's central area has been published.

**Table 1:** Regions covered by Libyan cancer registry program.

Place of cancer registry	Regions covered by the registry
Tripoli Cancer Registry	Tripoli, Aljafara, Almergaib, and Aljabal Algarbi
Benghazi Cancer Registry	Benghazi, Albatnan, Darna, Aljabal Alakhader, Almarg, Alwahat, Alkufra, and Ejhdabiya
Sabha Cancer Registry	Sabha, Morzuk, Wadi Alhiya, Wadi Shatee, and Ghat.
Misurata Cancer Registry	Misurata, Zliten, Ben Walid, Sirt, and Aljufra area
Sabratha Cancer Registry	Zawia, Sabratha, Zoara, and Nalut



**Figure 1:** General map of Libya; A: the major regions of cancer registries. B: the Libya population density (2015).

The details of this registration software are shown in (Table 1). However, because the majority of these registers are still in their infancy and incomplete, Libya still lacks a population-based national cancer registry [7,8]. In Misurata, a hospital-based cancer registry was established in 2008, and the first report on hospital data from that year was published [10]. The analysis estimated the scope of the cancer problem in Libya's central region, which has a population

## Materials and Methods

### Study Population

The clinical oncology services in most sections of central Libya are covered by the National Cancer Institute of Misurata (NCI-Misurata). According to the Libyan incomplete census of 2012, there were 6, 278, 438 people in Libya, with 3,156, 745 men and 3,121, 693 women, and only 386,120 people living in Misurata city (Figure 1B) [11].

### Ethical Approval

The study was approved by the Ethical Committee of the NCI-Misurata. All personal identifiers were stripped from the data and only medically significant parameters were analyzed out.

### Data collection

The data of cancer incidences was obtained from the patients' records of the department of Medical Oncology at the NCI-Misurata/ Libya. All patients were diagnosed at the same institute during the period from January 1, 2016, to December 31, 2016. The patients were diagnosed through various procedures. The histopathological examinations and radiological diagnosis of cancer patients were included in this study; however, uncertain diagnosed cases are excluded. The collected data from the patients' medical records included age, gender, city, and types of cancer. All cancer cases were coded using the International Classification of Diseases (ICD) [12]. Duplicate entry checking was done by comparing the data obtained from the department of pathology and laboratory for all cancer cases with that received from the clinical units of the hospital.

### Statistical Analysis

Microsoft Excel 2007 was applied to draw graphs and to evaluate relationships between variables.

## Results and Discussion

A total of 974 cancer cases were recorded at the department of registry in the NCI-Misurata, during the year 2016. Among them 45 % (n= 436) were males and 55% (n=538) were females (Figures 2 & 3). The most common cancer (overall) was found to be breast cancer (23.2%, n 226), followed by colon cancer (15.2%, n = 149) and lung cancer (9.3 %, n = 91) (Figure 4). In North Africa, it was pragmatic that the overall cancer rate, e.g, age standardized on world population ranged in men from 94.0/100,000 to 162.9/100,000, and in women from 84.7 to 164.0/100,000. The

most common cancers are comparable to those found in Europe, i.e., lung, breast, colon, and prostate but different from sub-Saharan Africa where infection-related cancers are the main common cancers [6,8]. The overall mean age of cancer patients at the onset of complaint (n = 974) was  $55.15 \pm 16.30$  years, ranging from 1 to 99 years. For male patients, (n = 436), the mean age was found to be  $57.76 \pm 13.43$  years, ranging from 1 to 92 years, while for female patients (n = 538), the mean age was  $53.03 \pm 15.51$  years, ranging from 17 to 99 years old. In this study we can clearly see that there are highest of cancers in females particularly at the age group of 41-50 years (see table 2).

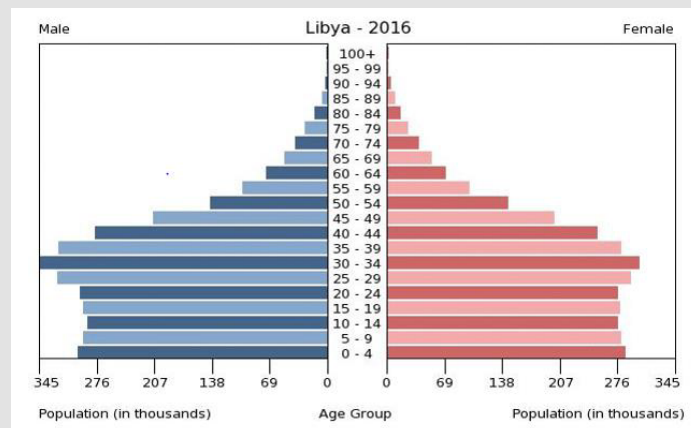


Figure 2: Pyramid pattern of the Libyan resident population (2016) according to age and sex [11].

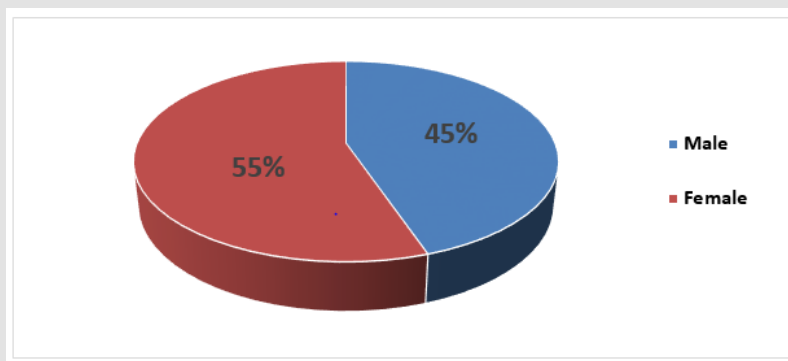


Figure 3: Distribution of cancers in NCI-Misurata 2016 (n=974) according to the gender of patient.

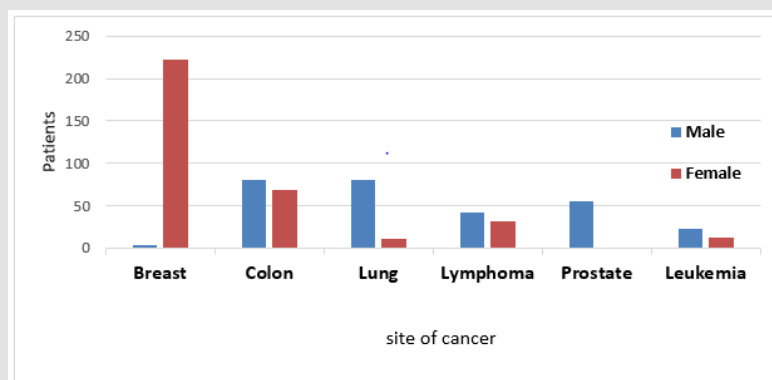


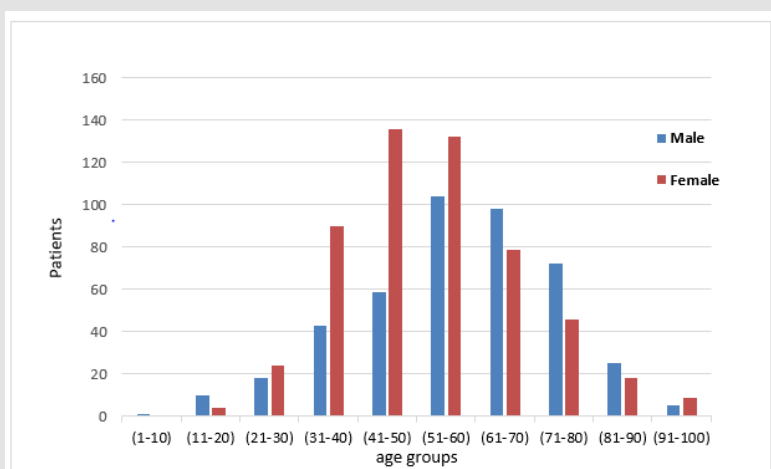
Figure 4: The most common types of cancers in NCI-Misurata 2016.

While women in general constitute the majority of cancer patients, this is due to the high prevalence of breast cancer among them. As the incidence of breast cancer peaks at the age below fifty (Figures 5 & 6 and Tables 2 & 3), the average age of cancer incidence among women is lower than the average age for men. On the other hand, prostate and lung cancer in males, both are occurred in male after the age of sixty (Figures 5 & 7 and Table 3). This reflects the nature of cancers affecting both sexes, while

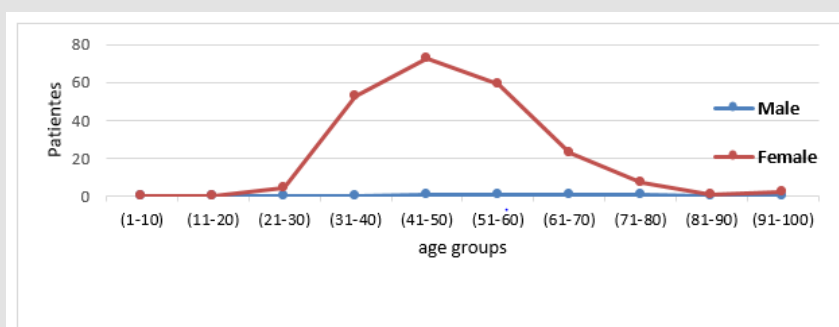
male primary malignancies tend to occur at a later age, and female primary cancers occur earlier. Another potential factor is that men tend to hide symptoms and delay seeking medical care, especially in developing countries [4,8]. In the present study, the most common cancers in males were colorectal (18.3%), lung (18.3%), prostate (12.6%), lymphoma (9.6%), leukemia (5%) and brain & CNS (4.1%).

**Table 2:** Cancer distribution among gender type and age groups.

Age groups	Male	Female	Cancer patients
(1-10)	1	0	1
(11-20)	10	4	14
(21-30)	18	24	42
(31-40)	43	90	133
(41-50)	60	136	195
(51-60)	104	132	236
(61-70)	98	79	177
(71-80)	72	46	118
(81-90)	25	18	43
(91-100)	5	9	14
total	436	538	974



**Figure 5:** The number of cancer patients (n=974) in different age groups.



**Figure 6:** Age distribution of breast cancers in males and females.

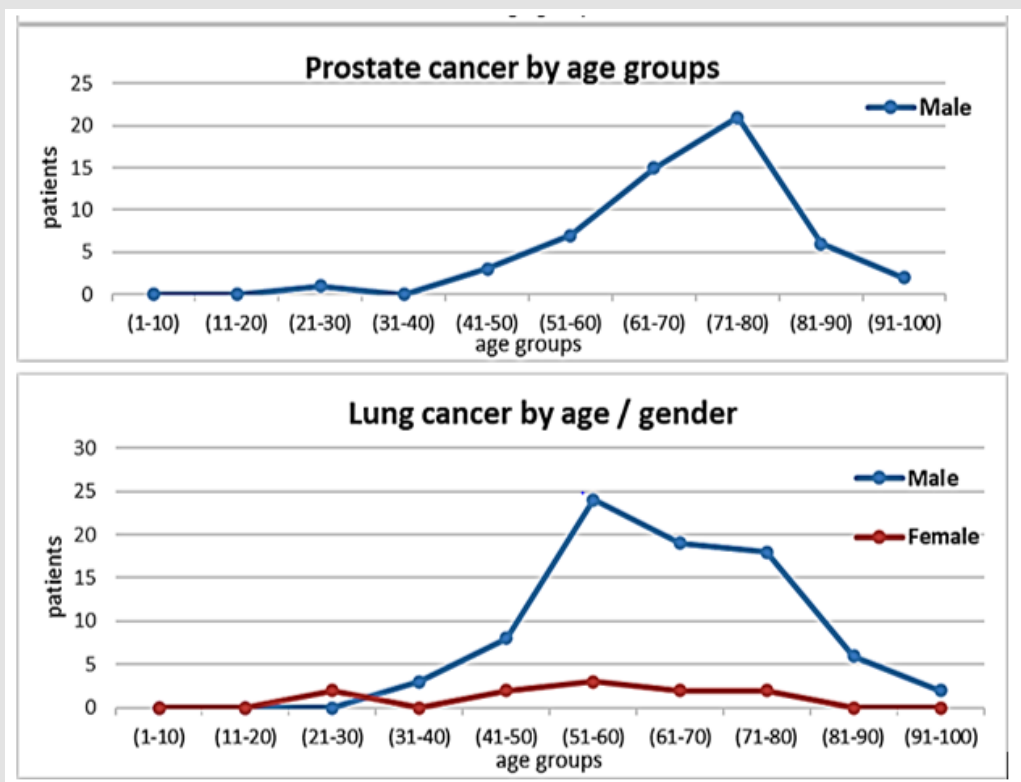


Figure 7: Age distribution of prostate cancer in males, and lung cancer in both males and females.

Table 3: Cancer incidences registered in NCI-Misurata 2016.

Site of cancer	Male	Female	Total	Minimum age	Maximum age	Means	SD
Breast	4	222	226	26	98	49.23	12.18
Colon	80	69	149	22	99	57.48	14.77
Lung	80	11	91	27	92	61.91	13.81
Lymphoma	42	32	74	16	90	44.58	18.2
Prostate	55	0	55	26	92	69.78	12.52
Leukemia	22	12	34	19	83	49.68	19.76
Brain & CNS	18	14	32	16	85	50.09	18.74
Ovary	0	31	31	22	75	51.61	13.31
Stomach	10	19	29	33	83	55.03	13.9
Pancreas	14	14	28	40	92	65.57	13.64
Uterus	0	27	27	29	92	64.22	15.15
Thyroid	3	19	22	22	76	48.05	16.22
Liver	15	5	20	24	82	61.7	13.03
Nasopharyngeal	15	5	20	17	63	44.8	11.59
kidney	7	8	15	49	94	64.4	13.51
Urinary Bladder	13	2	15	35	92	69	13.85
Blood	9	5	14	34	82	60.64	13.67
Bone	6	6	12	1	70	34.92	21.31
Gall bladder	3	7	10	49	67	59.1	5.53
Primary site unknown	7	3	10	45	77	61.4	9.44
skin	3	5	8	46	87	64	15.61

Liposarcoma	1	6	7	43	63	51.29	7.973
Testis	7	0	7	18	78	38	20.86
Cervix	0	5	5	46	72	60.4	9.81
Small intestine	4	1	5	42	77	60.6	16.69
GIST	3	1	4	42	65	56.75	10.14
Larynx	4	0	4	74	79	76.5	2.38
Esophagus	2	1	3	64	76	70.67	6.11
Tongue	0	3	3	26	55	39.67	14.57
Sarcoma	2	0	2	33	60	46.5	19.02
Urethra	2	0	2	62	64	63	1.41
other cancer	5	5	10	36	92	61.6	17.26
Whole cancers	436	538	974	1	99	55.15	16.3

Note: SD: Standard deviation

While in females, they were breast cancer (41.2%), colorectal (12.8%), lymphoma (5.9%), ovary (5.7%) uterus (5%), and stomach (3.5%). This data is similar to cancer cases registered in the western region of Libya 2008 [7]. They found that the most common cancers in males were lung (15.6%), colorectal (12.3%), prostate (9.9%), urinary bladder (7%) and stomach (5.5%) (Figure 4). While in females, they were breast cancer (23.7%), colorectal (9.4%), uterus (8.6%), soft tissues (5.3%) and stomach (5.2%). Furthermore, a study conducted in eastern Libya 2012 [9] which observed that in men cancer of colon accounted for 22.3%, followed by lung (20.3%), prostate (16.1%), pancreas (4.2%) and liver (4.2%). In women, breast cancer was (41.5%), remained the most common followed by colon cancer (16.4%), uterine (8%), ovary (5.5%) and pancreas (3.1%). The most common types of cancers found in the central region of Libya were breast, colorectal, lung, leukemia, and lymphoma.

Compared with the western and eastern regions of Libya, there was a similarity that lung, breast, and colon cancers were the most common in the three regions. However, pancreatic, and ovarian cancers were more common in the eastern region, but stomach and bladder cancers were more common in the western regions. While lymphomas and leukemias appeared more in the middle region. On the other hand, colorectal, lung and prostate cancers were the most common cancers diagnosed in men, while breast, colon and uterine cancers were the most common types of cancer among women in the three regions of Libya [7-9]. Breast cancer remains the most common cancer for females in both the western and eastern regions of Libya, rises in occurrence with age [6]. However, when

comparing average age of some cancers like breast among Libyan patients with patients from the sub-Saharan Africa (e.g, Nigeria) and Northern Europe patients (e.g, Finland), it was found to occur at earlier ages in Libya and Nigeria than in Finland [8,13]. In this study, we clearly saw that breast cancer occurred more in females at the age of 41-50 years. The incidence of colon cancer in NCI-Misurata was the second highest in the central region.

It is suspected that there is a strong relationship between this high rate of colon cancer and diet, as well as the absence of weight control and changing lifestyle habits of the Libyan people. The dramatic increase in the incidence of colorectal cancer may be explained by the better availability of endoscopic techniques for early detection and diagnosis [14,15]. The incidence of lung cancer in NCI - Misurata occupied the third rank in the incidence of cancers in the central region, and males showed 8 times more prevalence than females (Figures 6-8 and Table 3). It is suspected that there is a strong relationship between this high rate of lung cancer and the smoking habits of Libyan males. This increase in the incidence of lung cancer was noticed in Libya and all over the world. There were 1.82 and 1.59 million new lung cancer cases and deaths worldwide, respectively [1]. The increase in the incidence of lung cancer can be explained by the continuous improvement in radiological diagnostic tools and methods of cytological and histological examination for early detection of lung cancer. There is a significant lowering trend for non-Hodgkin lymphoma in female patients than males, however, it has remained fourth principal malignancy in women and fifth malignant tumour in men after prostatic cancer (Figure 9 and Table 3).



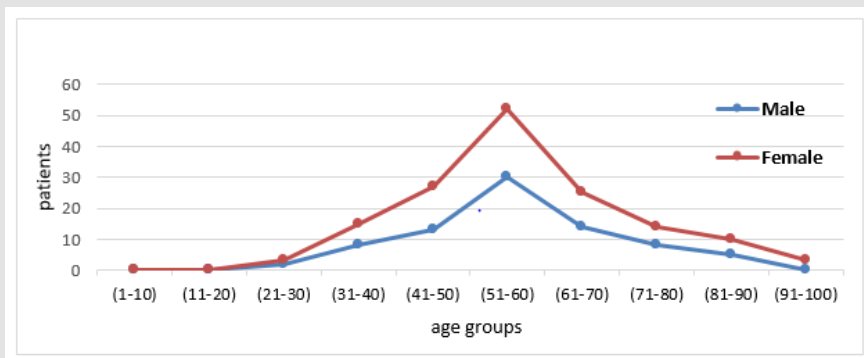


Figure 8: Age distribution of colorectal cancers in males and females.

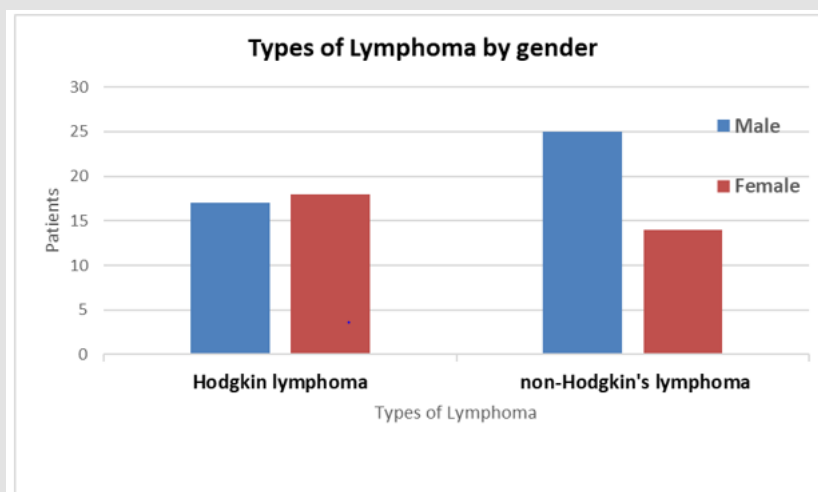


Figure 9: Gender distribution within both types of Lymphoma (HL and NHL).

### Conclusion

Using a hospital-based cancer registry, this study determined the prevalence of cancer cases in Libya’s central area. Although the data was limited in various ways, such as the precise geographical data of the research locations, the cancer patient’s family history, and the patients’ lifestyle and habits, it was nevertheless useful. The presence of certain epidemiological data on patients, on the other hand, has given us with crucial information regarding the size and scope of malignant diseases in Libya. Despite the fact that the prevalence of cancer is higher in industrialized countries, cancer mortality is often higher in developing countries due to a lack of early detection and treatment. As a result, future research should include fatality rates as well as probable carcinogenic risks. Despite the fact that people have been displaced to Misurata from the eastern and southern areas of Libya, this study reflects the reality of cancer cases diagnosed and treated at the National Cancer Institute in Misurata in the center region of Libya (which is the third largest population city in Libya). This is the sole hospital in the area that provides medical services to oncology patients.

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### Competing Interests

Authors have declared that no competing interests exist.

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