

## **The Epidemiology and Trend of Cancer in Misurata oncology center, 2012–2016 ,** Radwan M Ermis<sup>1</sup>, Abdulrzag F Ahmed<sup>2\*</sup>, Alhmmali A.M. Abdalla<sup>2</sup>, , Salem H Abukres<sup>3</sup>, Abdussalam A Sughir<sup>3</sup>, Shaban E. A. Saad<sup>4</sup> and Mohamed S Abughren<sup>5</sup>.

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### **ABSTRACT**

**BACKGROUND:** on the last decade in Libya, the oncology center in Misurata become the most important cancer diagnosis and follow up center on the western region of Libya. The Libyan society was worried about the increase of the percentage of tumor incidences among the Libyans on the last few years. This study focuses on cancer prevalence in city of Misurata and the surrounding area in central Libya from 2012 to 2016.

**METHODS:** A hospital-based registry of cancer patients was formed using records from oncology center in Misurata, focusing on patients who were diagnosed between 2012 and 2016.

**RESULTS:** the incidence of tumor on females was higher than males from 2014 up to higher deference on 2016, the most common malignancies in men were cancers of the lung on years from 2012 up to 2015 even though it decrease to 18% of males patients on 2016, followed by colon, its prevalence rate ranged from 14% to 18% of recorded male patients (For women, they were found to be cancers of the breast ranged from 29.84% on 2012 and raised to 43.08%. Additionally, age-standardized rates (ASR) were determined for recording patients who leaved on the city of Misurata and compared with published record from the other countries. The incidence rates given for the city of Misurata can be considered with the counties with low malignancy rate

**CONCLUSION:** Proper surveillance programs need to be in place and healthcare policy should be adjusted to consider the more prevalent and pressing cancers in society.

**Key words :** Misurata cancer center, breast cancer, lung cancer, colon cancer, Libya

## INTRODUCTION

Cancer is one of the leading chronic diseases in the world with an estimated 14.1 million new cases and 8.2 million cancer deaths in 2012 [1]. Almost 60% of these new cases and 65% of the deaths occurred in developing and low to middle income countries [1,2]. Because of this growing burden, identifying sources of accurate population-based cancer incidence data in developing countries is an immediate public health priority to inform local policy makers about cancer control and prevention, to provide a way to monitor success, and to provide data for international comparison. The incidence of certain cancers is diverging between different populations and geographic locations. These differences may associate with environmental, ethnic and/or genetic causes.[1] Modifying the environment and people lifestyle, may change the epidemiologic patterns of various cancers in these regions. Social lifestyle changes on Libyan society, the advances in cancer treatments and the introduction of screening for early detection of breast and cervical cancer, survival rates have been improved markedly.

Cancer registration in Libya is still limited until now. The public myth about cancer between the Libyan people is; the tumor incidence in Libya considered among the highest malignancy rates around the world. To find the truth about this myth, we used an age-standardized rate (ASR). ASR is a summary measure of the rate that would have been observed if the population had a standard age structure. Standardization is necessary when comparing several populations that differ with respect to age, because age has a strong influence on the risk of cancer. An ASR is a weighted mean of the age-specific rates; the weighting is based on the population distribution of a standard population. The most frequently used standard population is the World (W) Standard Population. The calculated incidence or mortality rate is then called the age-standardized incidence or mortality rate (W) and is expressed per 100 000 person-years. The World Standard Population used in GLOBOCAN was first proposed by Segi (1960),[3] and later modified by Doll et al. (1966) [4]. In this paper, we present the first data collected and analyzed by the science has dominated medicine for the last few years from the Misurata oncology center.

## METHODOLOGY:

The Libyan uprising reach its peak in 2014, this resulted in closing main roads to the other oncologic centers. These circumstances made the Misurata Oncology the only active available center on 214 up to 2016, this lead to increase the number of patients from other regions of Libya.

## DATA COLLECTION

Registration was carried out by active data collection; the registry staff routinely visited the Misurata oncology

center. A huge archive of prevalent cases was established from data since 2012 until 2016.

## PREVALENCE OF CANCER AND GENDER DISTRIBUTION

Prevalence of cancer cases in each year and how it was distributed among each gender was calculated, this was done to obtain the percentage of each kind of tumors for each gender during each year.

## COMPARATIVE STUDY

Since we were able to obtain only population average number of Misurata city, only the patients whose inhabited the city of Misurata were included. The world age-standardized incidence rate per 100,000 were calculate for the city of Misurata and compared with other countries. The year 2016 was selected for the comparative study because it had the highest prevalence tumors for each gender (breast, lung and colon).

Incidence rates and standardized incidence rates

Sex-specific and age-specific incidence rates for the year 2016 was defined as the number of new cancer cases per 100,000 members of the total population alive during the year 2016 in Misurata. The incidence rates of cancer cases were standardized regarding the age and sex distribution of the total population of the city of Misurata which was calculated based on the real census performed by Libyan statistics authority in 2016. In 2016, the city of Misurata population was estimated to be around 300,000 [5].

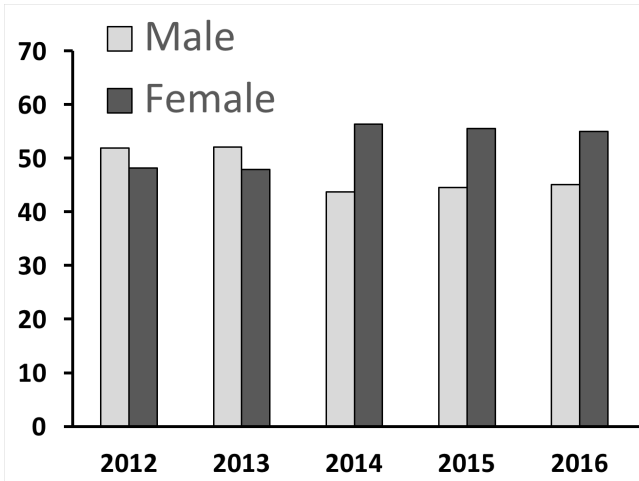
## DATA ANALYSIS

Data were analyzed using the SPSS software version 20 (SPSS, Inc., Chicago, IL, USA). Descriptive statistics expressed as mean, standard deviation (SD) and the frequency with percentages were calculated for interval and categorical variables, respectively. Chi-square test between categorical variables and Student's t-test for interval variables were used as appropriate. Results were considered to be statistically significant if the two-tailed P value was  $\leq 0.05$ . Age-standardized rate (ASR) (per 100,000 persons) was calculated using the direct standardized method and world standard population [6].

## RESULTS:

Prevalence of cancer and gender distribution

Figure 1 represents the cancer prevalence at Misurata cancer center from 2012 to 2016. In 2012 there was no considerable difference on cancer prevalence between males and females (51.9%, 48.1% respectively). Nearly the same results were recorded in 2013 (52.1%, 47.9% respectively). Interesting dramatic changes were recognized in 2014 where the incidence of tumor registered females (56.3%) significantly higher than that recorded on male patients (43.7%  $P \leq 0.01$ ), this difference remain almost at the same rang in years 2015 and 2016 (see Figure 1).



Since there are many different types of tumors, Figure 2 shows the distribution of the more frequent type of tumors according to patients' gender during the study period (2012- 2016). The most common malignancies in men were cancers of the lung, colon and prostate. For women, breast, colon and ovary cancer (see Figure 2 for more details).

Figure 1: Distribution of Cancer patients at Misurata cancer Center 2012-2016

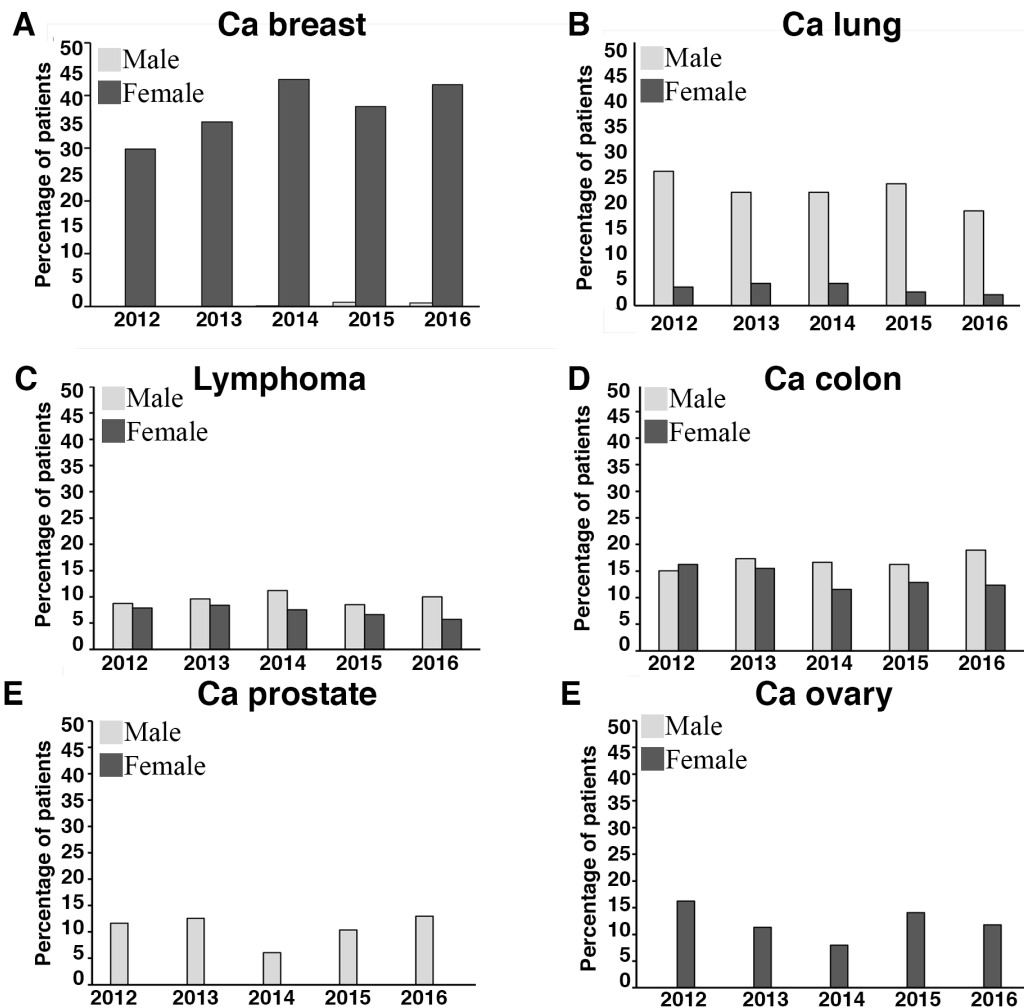


Figure 2: Distribution of patients according to more frequent cancer types

Figure 3, presents the percentage of the three most common cancers (breast, lung and colon), for four Mediterranean countries (Turkey, Palestine, Cyprus and Jordan) [12], and the city of Misurata.

Among the four Mediterranean countries registries, the largest variability of rates between countries in males was for lung cancer. Turkey had the highest lung cancer rate, five times as high as the rate in Jordan and Cyprus. Misurata and Palestine show a slightly insignificant increase in the lung cancer incidence rate than Jordan and Cyprus. Cyprus had the highest prostate cancer rate, nearly twice as high as Misurata. Interestingly, the city of Misurata shows highest rate of male colon cancer (19% of males) more than two times higher than Turkey (7.8%) and 1.5 higher than the other countries. Among females, the magnitude of variation across registries is not as large as in males. The largest variation is in breast cancer rates with the highest rate in the city of Misurata (42.05%) and lowest rate in Turkey (26%).

**Table 1: The age standardized rates (ASRs) of cancer per 100,000 of the city of Misurata and worldwide in 2016**

City/Country	Misurata	Egypt	Jordan	SA	UAE	South-Central Asia	Western Africa	Australia /New Zealand
No of cases per 100,000	73.4	166.6	142.5	78.1	74.2	295	95.9	365.2

SA: Saudi Arabia, UAE: United Arab Emaciates

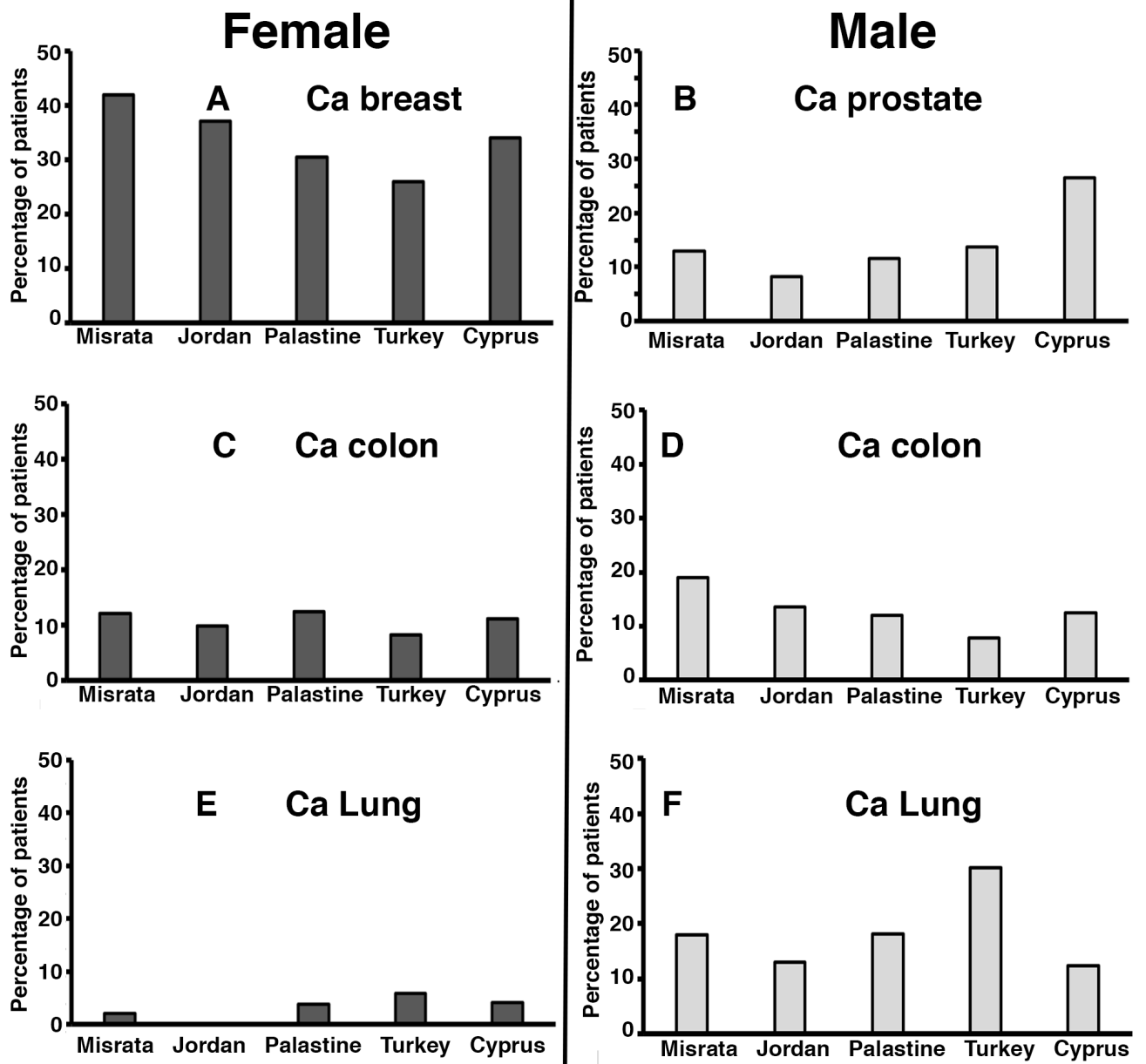


Figure 3: Comparison of tumor incidences of more frequent cancer types between Misurata cancer Center and some Mediterranean countries.

## DISCUSSION:

The increase in life expectancy, the reduction in mortality rates due to decrease in infectious diseases, and the increase in environmental exposures to carcinogens, including tobacco smoke and industrial chemicals are expected to result in a worldwide rise in cancer incidence in the coming years. [7]. Consequently, there is an urgent need for accurate data on population-based cancer rates in Libya to monitor increases and implement cancer prevention and control where needed. The purpose of this study was to examine the frequency of cancer rates over a six-years period and identify the most common cancers in the oncology center in Misurata using unified standardized methods for data collection, quality control and data analysis.

Our results show consistency in cancer cases among males and females in overall incidence rates within the center over the first two years of the study period. Also, the same results were recorded on considering all the selected tumor types. The fluctuation appeared clearly in 2014, where the percentage of overall female patient significantly higher than male patients (nearly 10% more on female patient). This difference stayed at steady state on the next two years; 2015 and 2016.

According to our results, we found high incidences rates of some types of tumors among the patients, first of all for female, about 35-43% of female malignant patients each year were breast cancer patients, Breast cancer is sometimes found after symptoms appear, but many women with breast cancer have no symptoms. Therefore, regular breast cancer screening is so important. Finding breast cancer early and getting state-of-the-art cancer treatment are the most important strategies to prevent deaths from breast cancer. Breast cancer that detected early, at early stages, is easier to treat successfully. Getting regular screening tests is the most reliable way to find breast cancer early. The Libyan health ministry should have screening guidelines for women at average risk of breast cancer, and for those at high risk for breast cancer.

Regarding Males patients, lung cancer was the most appended tumor type, this could be connected with smoking with both types of cigarettes and shisha, the Libyan traditional roles make it too difficulted form female to smoke, this makes the percentage of female smokers is far more less than males. This could explain the highly difference of lung cancer incidences between male and females.

According to Libyan social myth, the hypothesis is, the percentage of tumor incidences is considered on the among of the highest incidence rates on the world. To accept or reject this hypothesis, ASR was calculated for patient inhabited in city of Misurata on 2016. Our results showed that Misrata city has consistently lower cancer rates compared to other populations studied, even though we compared a city with countries, but this could reflect high percentage of truth, this also could be related to the Libyan average population age of Libyan citizen is 28.8 years. Matching the incidence rates of the most frequent tumor

types (breast, Colon and Lung) showed a slightly higher rate of breast cancer among Libyan female patients compared to four Middle east countries, this can be due to lack of early diagnosis and low social awareness about breast cancer.

## CONCLUSION

There is a slight but steady increase in cancer cases each year in Libya. In the recent years, the number of cancer cases among females was significantly higher than males. Overall, the prevalence of cancer rates among Libyan people who live in Misrata city is comparable to other Mediterranean countries. However, colon and breast cancers appear to be higher among Libyans than other Mediterranean countries. Therefore, early detection and patient education should be the priority of Health Ministry in Libyan to avoid more increase of such cancers. Future studies may explore reasons behind this increase in colon and breast cancers.

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