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## A descriptive epidemiological study of cancers at a South Indian tertiary care hospital

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### ABSTRACT

Incidence of cancer has been increasing throughout world in the recent decade. As the Warangal district in South India, has more cancer prevalence, we focussed to study the epidemiology of cancer in this particular area from the registries of a tertiary care hospital. This study was done at Mahatma Gandhi Memorial (MGM) Hospital, Warangal, Andhra Pradesh, India from June 2010 to June 2011. From the patients admitted during this study period, all possible information regarding age, gender, demographic data, cancer type, site and stage-wise cancer, treatment, follow-up period were gathered and analysed statistically. A total of 235 patients, of mean age 49.44 years (SD: 11.28), including 52.34% male and 47.65% female were admitted during the study period. The most predominant age group was 41-60 years. Among male, tongue cancer (11.91%) and among female breast cancer were more predominant (17.87%). The total sub-types of cancers, histopathology reports, stage wise distribution, treatment and follow-up periods were explained in detail. This study explains the proportion of various cancers over this south Indian population and provides a source of information, which help public health planners, administrators, healthcare team, and general public in the primary prevention and early detection of cancer.

**Key words:** Prevalence, Treatment, Histopathology, Administrators, Prevention

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## INTRODUCTION

Cancer occupies second position in the causes of death in developed as well as developing countries.[1] Incidence of cancer has been increasing throughout world in the recent decade. There exists a wide variety of reasons behind this including exposure to chemicals and pesticides, ionizing radiation, infection, hormonal imbalance, decreased immunity, heredity, tobacco, alcohol consumption, dietary habits and behavioral factors etc. Tobacco consumption, either by way of chewing or smoking accounts for 50% of all cancers in men and dietary practices, reproductive and sexual practices account for 20-30% of cancers. It is estimated that around 2.5 million, with over 8,00,000 new cases and 5,50,000 deaths occurring due to cancer each year in India.[2] India, having multi cultural, social habitats shows the prevalence of cancer different from one area to other. The incidence of Esophageal and stomach cancers is more in Southern India, gall bladder cancers are more in Northern India, particularly in Delhi and West Bengal, pharyngeal cancers are more in Western India (Mumbai).[3,4] Clinical epidemiology and Clinical Pharmacology are two essential areas for integrating the health sciences as well as a source for future trends. From the past 50 years, great efforts have been spent for gathering data across hospital, state, countries as to study the impact of environmental and cultural factors on cancer incidence. The past epidemiological reports of cancer have shown that poverty and illiteracy are the major factors for the deaths by oral as well as cervical cancers. Warangal district in Andhra Pradesh, South India, has more cancer prevalence. Hence we focussed to study the epidemiology of cancer in this particular area from the registries of a tertiary care hospital.

## MATERIALS AND METHODS

In order to evaluate differences in risk among populations requires incidence rates, of which the data is derived from population based cancer registries, which aim to record information on all newly occurring cases in a particular population. We collected and analysed data of all patients who were admitted with any type of cancer to Mahatma Gandhi Memorial (MGM) Hospital from June 2010 to June 2011. It is a 1100-bed government tertiary care teaching hospital in the city of Warangal, Andhra Pradesh, India. It is the referral hospital for cancer patients from Warangal district, other districts like Adilabad, Khammam, Karimnagar and Nalgonda. Total In-patient admissions to the hospital average about 300 per day. After diagnosis of cancer, patients are admitted to department of Oncology, which contains 20 beds, four doctors and four nurses. There is a separate Radiology intensive care unit with two doctors and two nurses for those patients who require radiation therapy. Present data were collected retrospectively from medical record case sheets. All hospitalized cancer patients were included. For the patients admitted during this study period, all possible information regarding age, gender, demographic data, type of cancer, site-wise and stage-wise cancer, mode of treatment, follow-up period were gathered. Later data from all case sheets were analysed statistically.

## RESULTS AND DISCUSSION

Incidence of cancer has been increasing in recent times. This is mainly because of exposure to pesticides, urbanization, industrialization, lifestyle changes, population growth and increased life span. In India, the life expectancy has steadily risen from 1971 (45 years) to 1991 (62 years), which indicates a shift in the socio-demographic profile.[5] Warangal district in Andhra Pradesh, Southern India, is having a large population and many cancer cases each year. Previous studies in this area have shown that the incidence is getting increased [6]. In our present study totally 235 patients were admitted with the diagnosis of cancer. Among them 52.34% male and 47.65% female with a mean age of 49.44 years (SD: 11.28). Men outnumbered women in all age groups, except the age group 21-40 years. The most predominant age group was 41-60 years. This shows the increased life expectancy.[5] Nearly half of the patients (48.51%) were aged in between 41-60 years and there were very few cases in the age groups 0-20 years and >80 years. This data is indicated in Table no: 1. Most of the patients were from rural background (88.93) and very few of them were from urban areas (11.06%) as this area is having more rural population. Now-a-days exposure of agricultural workers to a variety of chemical, physical, and biological hazards in the process of cultivating and harvesting crops and/or raising livestock is getting increased [7, 8].

**Table 1: Age-Sex distribution**

AGE GROUP (Yrs)	TOTAL	MALE	FEMALE
0-20	1 (0.42%)	1 (0.42%)	0
21-40	44 (18.72%)	18 (7.65%)	26 (11.06%)
41-60	114 (48.51%)	60 (25.53%)	54 (22.97%)
61-80	74 (31.48%)	42 (17.87%)	32 (13.61%)
>80	2 (0.85%)	2 (0.85%)	0
TOTAL	235 (100%)	123 (52.34%)	112 (47.65%)

In India due to habits such as chewing of betel nut, tobacco consumption in the form of chewing or smoking, mouth cancers are common. Reverse smoking also causes cancer of palate.[9] In our study Head and neck cancers are the major type of cancer (42%), including 22.51% oral cavity and 19.11% oropharynx cancers. Among head and neck cancers, tongue cancer is most predominant (11.91%) when compared to others as shown in the Figure no: 1. According to epidemiological investigations, 80-90% of all cancers are due to environmental factors among which, lifestyle related factors are the most predominant and preventable [10]. The major risk factors for cancer are tobacco, alcohol consumption. Tobacco consumption, either by way of chewing or smoking accounts for 50% of all cancers in men. Studies have shown that appropriate changes in lifestyle and social habits will reduce the mortality and morbidity caused by cancer [11]. This indicates the need for initiating primary and secondary prevention measures for control and prevention of cancers mainly head and neck cancers [12]. Breast cancer accounts for 17.87%, and it is the most predominant one among women. Women above 45 yrs are more prone to breast, cervical, ovarian cancers and as the most predominant age group in our study was 41-60 years, these type of cancers more like other studies [13]. Gynaecological cancers accounts for 11.05% including cervix, uterus and ovary. The number of patients for each type is shown in Figure No. 2. Cancers of gastro-intestinal tract (10.61%) are

also recorded in this population. This can be attributable to dietary habits. The Types of GIT cancers are shown in the Figure No: 3. All other types of cancers which were recorded are also analyzed according to their site and represented in Figure No. 4.

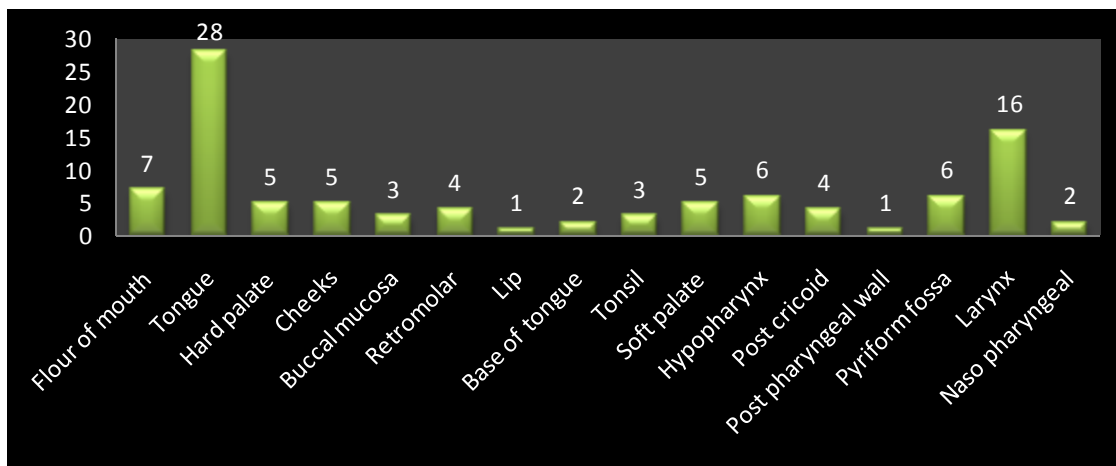


Figure 1: Head and Neck Cancers

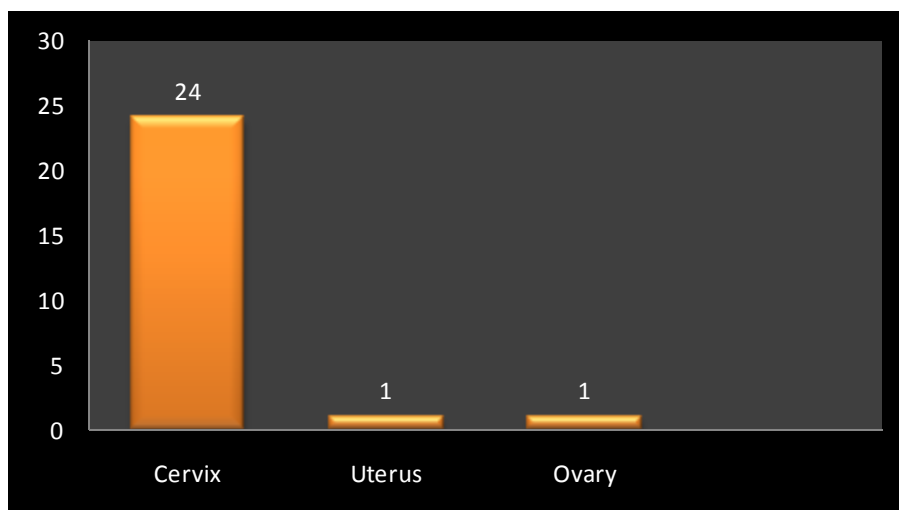


Figure 2: Gynaecological cancers

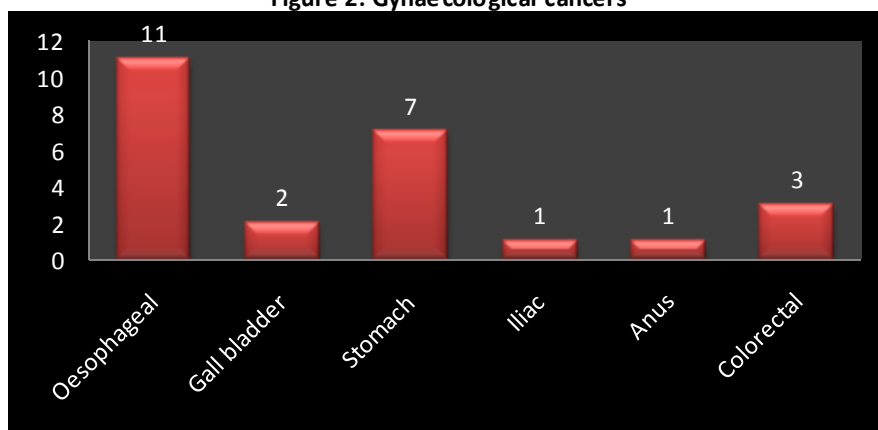


Figure 3: GIT Cancers

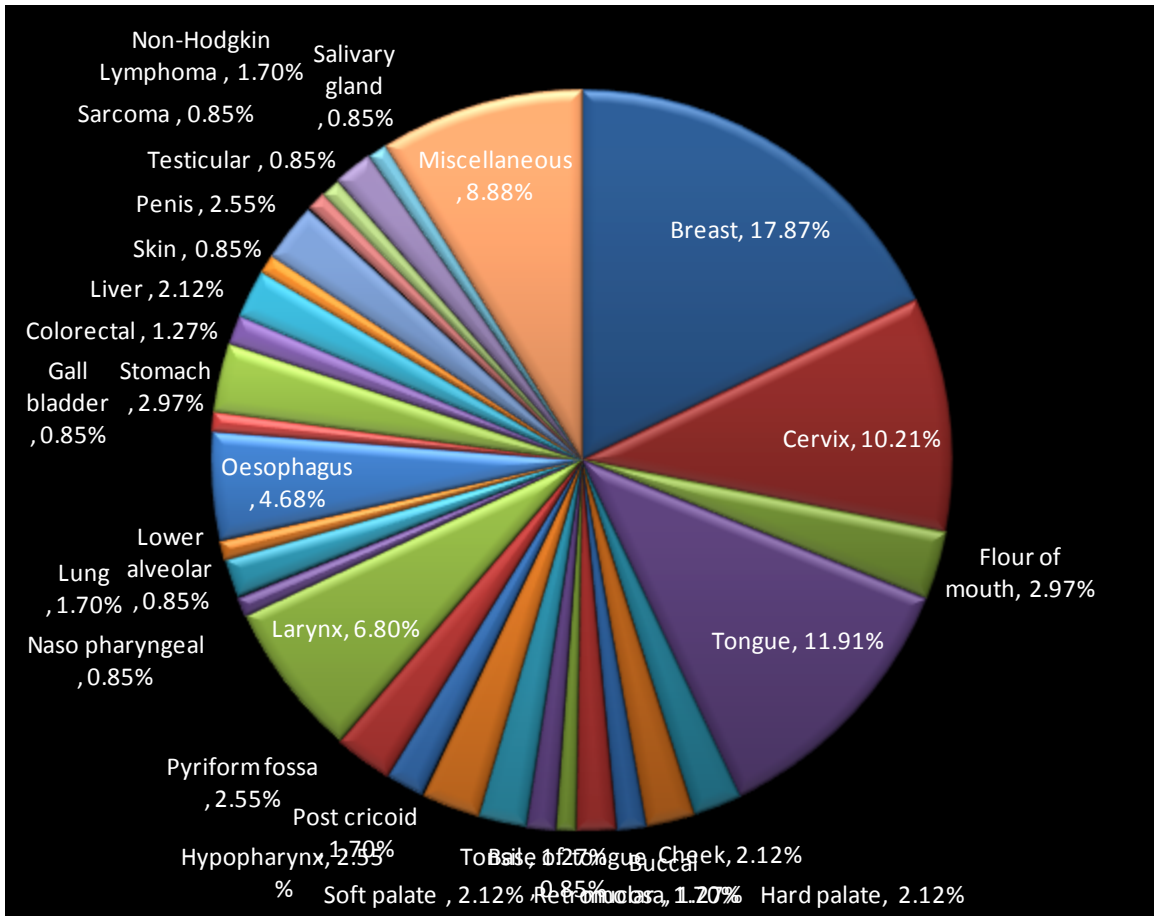


Figure 4: Type of cancers-Site wise

The interesting findings of our study are the histopathological reports. There are varieties of reasons that can suspect a cancer, but the exact diagnosis is confirmed by histological examination of the cancerous cells from a biopsy or surgery. The tissue diagnosis indicates the type of cell that is proliferating, its histological grade. This information is useful for the prognosis and choosing the best treatment. We studied all the histopathological reports of our patients and found that squamous cell carcinomas (56.69%) are more as represented in Figure No. 5. However data of some patients was not available (13.19%). All types of squamous cell carcinomas are classified based on their diagnosis are shown in Figure No. 6. Till now very few authors presented this histopathological data in the area of South India.

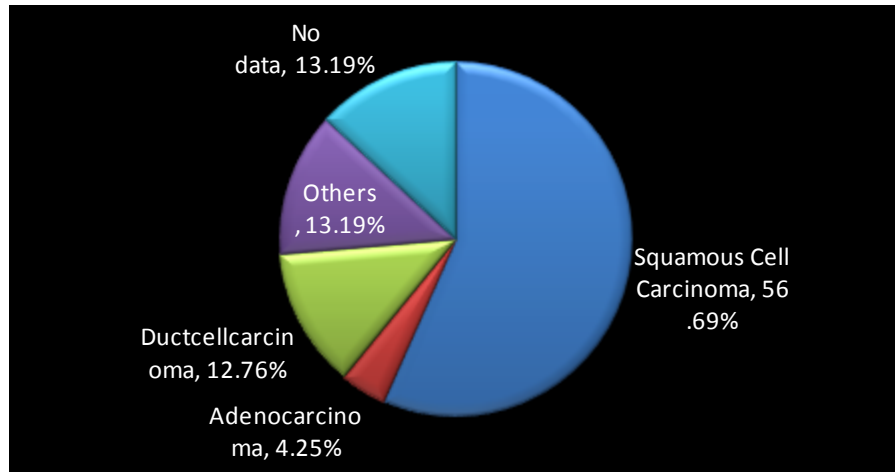


Figure 5: Histopathology reports

At time of diagnosis the stage of disease was recorded. But, data of some patients was not available (66.38%). The most commonly applied staging system for solid tumors is the TNM classification. T represents tumor size ranging from T<sub>1</sub> to T<sub>4</sub>, Carcinoma in situ as T<sub>is</sub>. N is extent and quality of nodal involvement ranging from N<sub>0</sub> to N<sub>3</sub>. M represents metastases, depending on their presence or absence M<sub>0</sub> or M<sub>1</sub> are denoted. Usually a numerical value is assigned to each letter to indicate the size or extent of disease. most cancers are classified based on extent of cancer as stages I to IV. Stage I is localized tumor, stages II, III are local and regional extension, and stage IV denotes the presence of distant metastases. The criteria for classifying disease extent vary from cancer to cancer[14]. Alternative alphabetical systems (stage A, B, C, or D) are also in clinical practice. Most of the patients in our study were in advanced stages like in Stage-III (6.38%). Most of the patients were in advanced stages (6.38% were in Stage-III). Stages of all patients are shown in Figure No. 7.

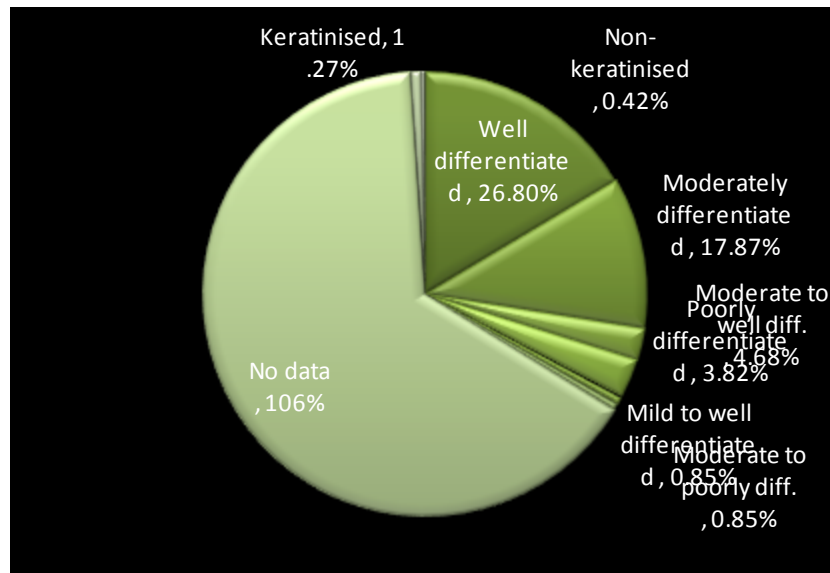


Figure 6: Squamous Cell Carcinomas

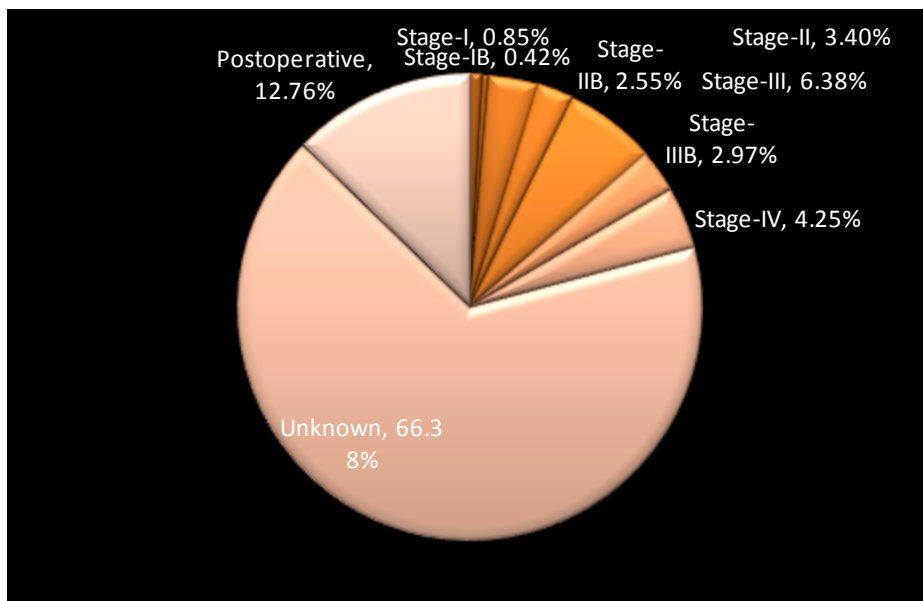


Figure 7: Stage wise distribution

Mode of treatment depends on the type and stage of cancer. Four primary modalities are employed in the approach to cancer treatment at our hospital are surgery, radiation, chemotherapy, and chemo-irradiation. For most of the solid tumors diagnosed in the early stages, surgery remains the treatment of choice. Among all only 1% of patients underwent surgery, as most of the cancers were detected in advanced stages. Radiation therapy was first introduced in late 1800s, since then it is the best management choice for cancer. In our study most of the patients (60.42%) underwent radiation therapy. Chemotherapy enables systemic circulation and effective in treating primary and any metastatic disease.[15] It is given to 29.36% patients. Both chemotherapy and radiation therapy were given to 9.36% patients to combat the cancer. It is represented in Figure no. 8.

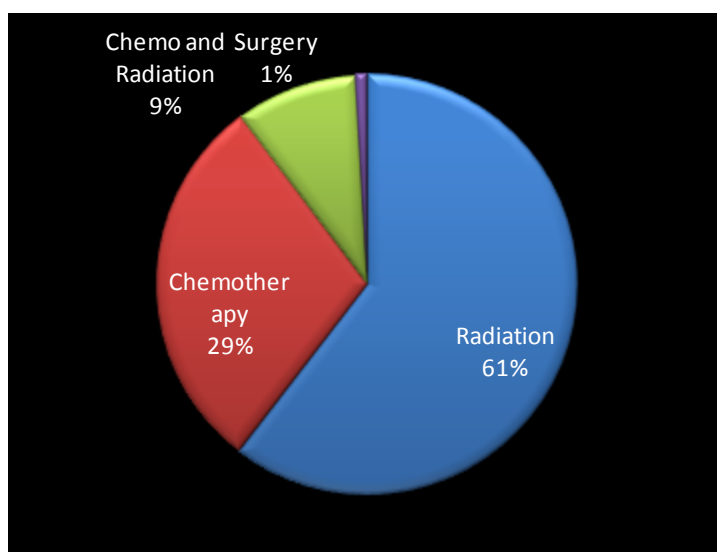


Figure 8: Mode of treatment

The total duration of treatment varied from 1-18 months. Most of the patients (57.87%) were treated within six months of admission. There is also a record of irregular follow-up in 1.27% and no follow-up in 31.91% patients. This may be because of the impact of emotional stress after cancer diagnosis and economical burden for treatment, especially in a developing country like India. The cancer experience has been found to induce fatigue, [16-18] which will influence the Quality of Life (QoL) in cancer patients and effect the follow-up. The follow-up of male and female patients is indicated in Table No.2.

**Table 2: Follow-up**

DURATION (Months)	TOTAL	MALE	FEMALE
1-6	136 (57.87%)	69 (29.36%)	67 (28.51%)
7-12	20 (8.51%)	13 (5.53%)	7 (2.97%)
13-18	1 (0.42%)	0	1 (0.42%)
Irregular followup	3 (1.27%)	0	3 (1.27%)
No follow up	75 (31.91%)	39 (16.59%)	36 (15.31%)
Total	235 (100%)	121 (51.48%)	114 (48.52%)

## CONCLUSIONS

This study explains the proportion of various cancers over this south Indian population. The quantities measure the changes in the occurrence and potential impact of primary prevention. This work provides a source of information, which help public health planners, administrators, healthcare team, and general public in the primary prevention and early detection of cancer. As older people are more, constant and routine assessment of the Quality of Life (QoL) and factors that affect it may help them. Most common type among male is cancer of tongue (11.91%) and among female is breast cancer (17.87%). Establishment of equitable, pain control and palliative care network can improve the follow-up. Avoiding tobacco and alcohol use, taking healthy diet, maintaining ideal body mass index (BMI), avoiding sun exposure, vaccination against hepatitis B, healthy practices and regular screening can prevent cancer.

## ACKNOWLEDGEMENTS

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