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## ORIGINAL RESEARCH ARTICLE

# CANCER PREVALENCE TREND IN CENTRAL REGION OF NEPAL

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## ABSTRACT

Cancer is a multi-cellular disease that causes excessive proliferation of cells. In this study, our objective was to determine the epidemiological distribution patterns for different types of cancer. A retrospective cross-sectional descriptive study was conducted. A modified data collection form was used to collect the information regarding religion, ethnicity, sex and district. A total of 240 cancer patients were included in the study. Majority (83.33%) of cancer patients were Hindus and among them Newars were the most affected ones with 30.42% prevalence. The gender wise distribution presents that females were highly affected by cancer than males. Within male patients, respiratory and digestive cancers were highly prevalent with 50.53% and 30.53% respectively. When respiratory cancer cases were further studied, lung cancer constituted the most cases with 60.42% cases. In case of female patients, reproductive and respiratory cancers were most prevalent with 62.07% and 14.48% cases respectively. Among reproductive cancers, breast cancer was highly prevalent with 45.56% cases and the susceptible age group for this was 40-50 yrs. The district wise distribution presented that mostly patients were from Kathmandu, Lalitpur, Bhaktapur and Sindhupalchowk districts. Findings from current study revealed that cancer cases in both males and females were common but females were highly prone to reproductive cancer whereas males were prone to respiratory cancer. Continual future research on cancer trends is warranted to study the actual cancer scenario.

**Key Words:** *Cancer, retrospective cross-sectional descriptive study, reproductive cancers and actual cancer scenario*

## INTRODUCTION

Cancer is a multi-cellular disease which can arise from any cell types and organs with multi-factorial etiology. [1] It is a dreadful disease which brings tremendous social distress, psychological suffering and hardship to the patients and relatives. [2] The word cancer means the change in the body's cells that cause them to grow out of control. [3] These are neoplastic disorders caused due to excessive proliferation of cells. Cancer is one of the most dreaded non-communicable diseases that have become the important contributor to the global burden of disease. [4] Causes of cancer include principally environmental factors, of which the most important are tobacco, dietary factors, body mass and physical activity and exposure in the workplace.Cancer is the leading cause of death in economically developed countries and second leading cause of death in developing countries. In 2011, one out of four deaths in United States was due to cancer. [5] In many countries, cancer ranks second or third most common cause of death falling behind cardiovascular disorders. With significant improvement in management of cardiovascular diseases, it can soon become the leading cause of death in many parts of the world. Due to advancements in health care systems, life expectancy of the individuals increases and so does the

elderly population. As the chances of cancer incidence in elderly are high, the cancer prevalence may increase dramatically in years to come. [6] Due to this, cancer has become an important agenda in the health sector of every country.

According to the World Health Statistics 2012, cancer accounts for the second largest proportion of non-communicable disease deaths (21%). It is estimated that the annual number of deaths due to cancer will increase from 7.6 million in 2008 to 13 million in 2030. More than two thirds of all cancer deaths occur in low and middle-income countries with higher prevalence of lung, breast, colorectal, stomach and liver cancers. In Nepal, the age-standardized adult mortality rate by cause for cancer is 178 per 100000 populations, out a total of 897 which accounts for all causes. [7] In our study; we have attempted to make epidemiological observation of cancer patients in one of the major tertiary care hospital for cancer treatment in Central region of Nepal. The distribution of different cancer types on the basis of religion, ethnicity, sex and district were evaluated.

## MATERIALS AND METHODS

### Study type
A retrospective cross-sectional study was conducted, which evaluated the prevalence pattern of cancer for the year 2012.

### Study site
The study was conducted in one of the major tertiary care hospitals for cancer treatment of Central region of Nepal i.e. Bhaktapur area. The collection of data was done from the in-patient medical record files of the year 2012.

### Data collection
A modified data collection form was used to collect the information regarding religion, ethnicity, sex and district.

### Operation Modality
The in-patient record files were obtained from the hospital and the specified fields in the form were filled. The data collection was performed by all the members of the research group and was cross checked by one another for any missed information.

### Sample Size
240 in-patient records of cancer patients for the year 2012 were included in the study.

### Data Analysis
Results were analyzed using SPSS version 12.0 for windows.

## RESULTS AND DISCUSSION

### Religion wise distribution of cancers
Figure 1. shows the cancer prevalence pattern among patients of different religions. It is evident that majority of the cancer patients were Hindus followed by Buddhists. Nepal is predominantly a Hindu country. So, the prevalence of greater Hindu cancer cases can be related with the fact that the Hindus comprise the higher population of Nepal.

### Ethnicity wise distribution of cancers
The ethnicity wise distribution of cancer patients is shown in Table 1. The study revealed that cancer prevalence, among the various ethnic groups, was highest in the Newars followed by Chhetri and Brahmin. The "others" ethnic group included Dalits, Madhesis, Kami, Jogis, etc. This could be attributed to the fact that the majority of local inhabitants of the Bhaktapur area are Newars and their proximity to the cancer hospital is less so that they can easily make frequent visits. Chhetris and Brahmins with second and third places were not unexpected. This is because of the fact that the most recent census statistics of Nepal shows prevalence of Chhetris and Brahmins as top two ethnicities. On the standings, Newar population is the fifth largest population, but since the local inhabitants of the Bhaktapur area comprise largely of the Newar community, the greater cancer cases with Newars in our study could be justified. [8]

### Gender wise distribution of various cancers
The gender wise distribution pattern of cancer patients is shown in Table 2. On analyzing the distribution pattern, the data represented that cancer was more prevalent in females than males. The greater prevalence of cancer in females can be because of the involvement of their reproductive system such as the cervical cancer, ovarian cancer and breast cancer which occupy the major portion among all other forms of cancer. [9] These susceptible body parts cause greater incidence of cancer problems in the females. Another way of interpreting the increased incidence of cancer cases in females is the spare time they can utilize to make hospital visits. Nepalese female population is less employed than males. This means that the female population has free time to visit hospitals and the frequency of hospital visits by females is more than males, which provides greater chances of cancer diagnosis. [10]

### Physiological system wise distribution of cancers in males
The physiological system wise distribution of cancers in males as presented in Figure 2 revealed that respiratory cancer was the most prevalent one with digestive cancer being the second. This can be attributed to the involvement of males in occupations like agriculture, construction of roads and bridges, manufacturing, and transport where there is greater exposure to carcinogens thus increasing the risks of cancers related to respiratory system. [9] The greater degree of smoking and alcohol consumption along with unhealthy and unhygienic dietary habits in males might be the cause of greater prevalence of cancer of respiratory and digestive system.

On further analysis of the type of respiratory cancer (Figure 3), the data revealed that lung cancer was the most prevalent form in males. This was followed by the cancers of upper respiratory tract (URT) and bronchogenic cancers. It is estimated that 85% cases of lung cancer is because of tobacco and Nepal has amongst the highest number of male smokers. [9]

### Physiological System wise distribution of cancers in females
Figure 4 reveals the complete data of the prevalent cases of cancers affecting various physiological systems in females. The data revealed that reproductive system was highly affected followed by respiratory and digestive systems. The prevalence of reproductive system cancer was almost 4.3 times higher than the respiratory cancer that holds the second spot.

As the reproductive system was highly affected in females, under further analysis Figure 5 explains the types of reproductive cancers prevalent. The prevalence of breast cancer was the highest reproductive type of cancer in females. It comprised of 45.56% of the total reproductive cases. Breast cancer is the leading cancer in the world and Nepal is no exception. It is the second most common malignancy among women in Nepal which is more common in young premenopausal women. Breast cancer continues to increase in incidence due to lifestyle changes in Nepalese women despite constant remarkable development in the management of this disease over the past three decades. [11]

Age wise distribution of breast cancer is presented in Table3 which reveals that the prevalence of breast cancer cases is highest in the age group of 40 to 50 years. The average age of detection of cancer was found to be 47.6 years. The report on breast cancer published by American Cancer Society revealed the average age of breast cancer detection as 61 years of age.[12] The early detection of breast cancer in Nepalese context can be attributed to the greater use of oral contraceptive pills. The risk of developing breast cancer increases with advancement in age of the woman. The most consistent determinant of risk in various populations is the woman's age at first full-term pregnancy. Women with a first full-term pregnancy after age 30,

and women who never gave birth to the child have about a two- to three-fold increased risk of breast cancer compared to women having a full-term pregnancy before age 20. The greater number of women who had delayed childbirth or remained childless may explain some of the recent causes of increased incidence for breast cancer. 13 Second to breast cancer in females was the prevalence of cervical cancer. Early marriage, changing sexual behavior, heavy workload and more children bearing are the major causes for increased incidence in cervical cancer. [14]

**District wise distribution of cancer patients**

The top 5 districts with highest cancer cases are presented in Figure 6. The district wise distribution of cancer patient showed that the cancer cases were highest among Kathmandu, Lalitpur, Bhaktapur and Sindhupalchowk districts. This could be related to the near proximity of the cancer hospital from these places. The number of cases outside these districts was low. The cancer patients from all over Nepal came to the Cancer Hospital for treatment, but the cases analyzed were less outside the Bagmati zone. The less cancer cases were from other districts including Kabhrepalanchowk, Morang, Nuwakot, Dhading, Okhaldhunga, Sunsari, Dolakha, Jhapa, Khotang, Sindhuli, Udaypur, Dhankuta, Lamjung, Nawalparasi, Ramechhap, Baglung, Bara, Bharatpur, Doti, Gorkha, Gulmi, Kanchanpur, Kapilvastu, Mahottari, Myagdi, Panchathar, Rasuwa, Sarlahi, Siraha, Arghakhanchi, Baitadi, Bajura, Bardia, Dang, Dhanusa, Humla, Illam, Kailali, Kaski, Parsa, Rukum, Rupandehi, Salyan, Sankhuwasabha, Solukhumbu, Surkhet and Tanahu. The cases analyzed were from almost every part of Nepal. This might be due to the treatment facilities that the hospital provides to the patients and the availability of highly specialized and experienced doctors at the facility.

**Table 1: Ethnicity wise distribution of cancer patients**

| S.No. | Ethnicity | Percentage |
|-------|-----------|------------|
| 1 | Brahmin | 20.00 |
| 2 | Chhetri | 22.92 |
| 3 | Gurung | 4.58 |
| 4 | Limbu | 0.42 |
| 5 | Magar | 1.67 |
| 6 | Mongolian | 7.92 |
| 7 | Newar | 30.42 |
| 8 | Rai | 2.08 |
| 9 | Tamang | 0.83 |
| 10 | Thakuri | 2.08 |
| 11 | Tharu | 0.42 |
| 12 | Others | 6.67 |

**Table 2: Gender wise distribution of cancer patients**

| S.No. | Sex | Percentage |
|-------|-----|------------|
| 1 | Male | 39.58 |
| 2 | Female | 60.42 |

**Table 3: Age wise distribution of breast cancer**

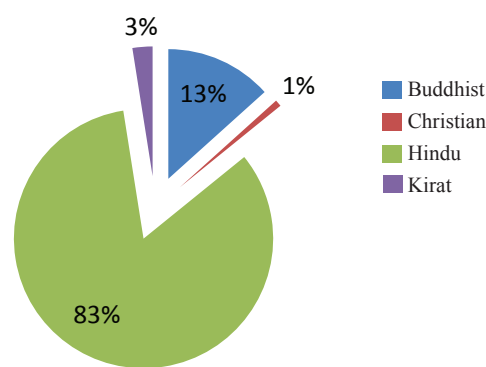| Age Group (yrs) | <10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | >80 |
|-----------------|-----|-------|-------|-------|-------|-------|-------|-------|-----|
| Cases | 0 | 0 | 4 | 7 | 16 | 6 | 6 | 2 | 0 |
| % | 0 | 0 | 9.76 | 17.07 | 39.02 | 14.63 | 14.63 | 4.88 | 0 |



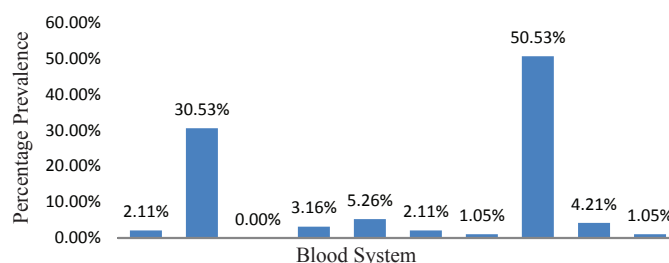**Figure 1: Religion wise distribution of cancer patients**



**Figure 2: Physiological system wise distribution of cancers in males**
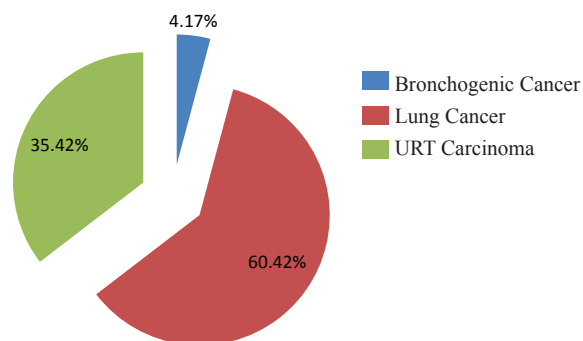


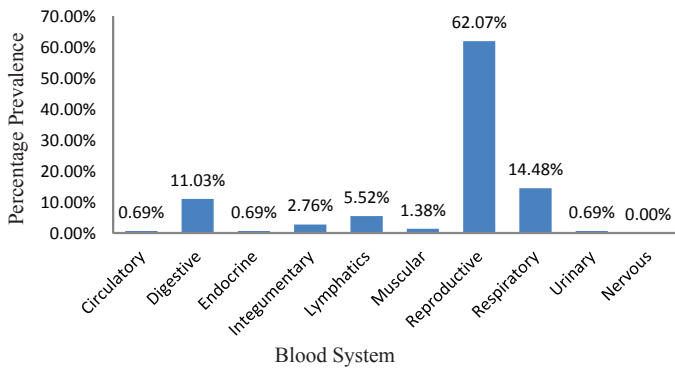**Figure 3: Type of respiratory cancers in males**

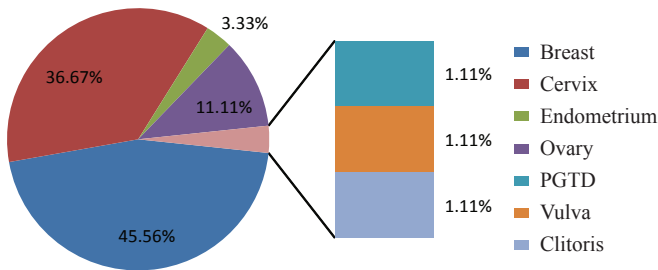**Figure 4: Physiological system wise distribution of cancers in females**



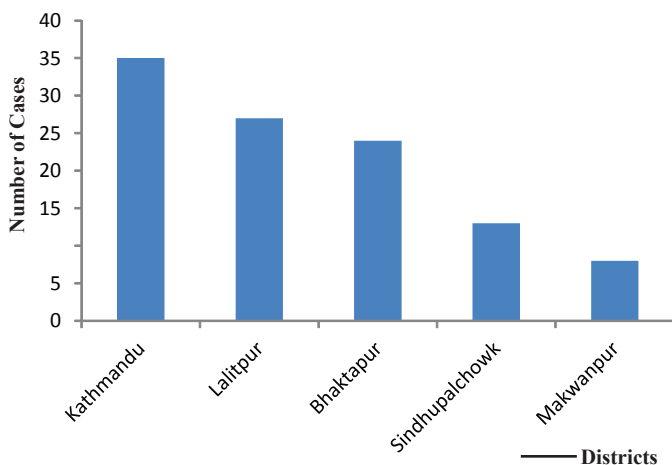**Figure 5: Type of reproductive cancers in females**



**Figure 6: District wise distribution of cancer patients**

## CONCLUSION

From the study, we can conclude that cancer is more prevalent in Hindus and especially Newars. Females were more prone to cancer than males with reproductive cancer and respiratory cancer being the most prevalent in females and males respectively. Continual future research on cancer trends, including substantial study periods, is warranted to study the actual cancer scenario.

## ACKNOWLEDGEMENT

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