

RESEARCH ARTICLE

Distribution of Cancer by Sex and Site in Nepal

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Abstract

Background: Cancer is one of the leading causes of death throughout the world. The indicators of cancer by site are significant to identify the problem of cancer. The purpose of this retrospective study is to perform the incidence of all cancers both in males and females over the ten years in Nepal. **Methods:** The data collected from all the seven hospital based cancer registries of Nepal have taken for the study. This retrospective study has presented the number of cases, frequencies, and crude incidence of all cancers by sex and site. **Results:** A total of 55,931 cancer cases with known age were registered throughout the hospital based seven cancer registries of Nepal from 2003 to 2012. Throughout the ten years, Lung (incl. trachea and bronchus) cancer (19.08%) was the major cancer in males followed by stomach cancer (7.86%) and Pharynx cancer (5.4%). Similarly, Cervix cancer (21.9%) was the most common cancer in females followed by breast (15.48%) and Lung (incl. trachea and bronchus) cancer (10.47%) over the ten years. This retrospective study presented the distribution of the cancer site over the ten years in Nepal. **Conclusion:** This retrospective study showed that lung cancer is the major cancer in male while in female cervix uteri is the most common cancer ranging from 2003 to 2012.

Keywords: Cancer-sex-site- incidence

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Introduction

Nepal has altogether seven hospital based cancer registries (B P Koirala Memorial Cancer Hospital, Bhaktapur Cancer Hospital, Bir Hospital, TU Teaching Hospital, Kanti Children Hospital, BP Koirala Institute of Health Science and Maniatal Teaching Hospital). The first hospital-based cancer registry was established in 2003 with the support of World Health Organization (WHO). Nepal did not have population based cancer registry, however, couple of documents were published which showed the burden of cancer cases in Nepal (Pun et al., 2015; Pradhananga et al., 2009). Owing to the lack of population- based cancer registry in Nepal, we had taken the population (denominator) from the census and cases from the hospital. This research aimed at finding the distribution of cancer site in Nepal. This result remains beneficial for policy makers and concerned stakeholders in regard to taking up a control programme for the prevention of cancer in future.

Materials and Methods

The present project utilizes research of data collected in National Cancer Registry programme from the record

of seven hospital based cancer registries ranging from 2003 to 2012. We had added the cancer cases together within categories as per International Classification of Disease for Oncology (ICD-10) published by World Health Organization (WHO). We had also added cancer cases within the age categories defined by 0-14, 15-34, 35-64 and 65+ to make the number comparable with all the reports. All double/multiple entry cases were excluded by cross checking name, sex, address and hospital registered number of each patients. We analyzed 26,064 male cases and 29,867 female cases whose ages were known. All cancer cases by age, sex, site and year were abstracted from the medical record sections of national cancer registry forms of all hospitals. The collected data were entered in Excel Sheet with respect to years, sex and site. The population growth rate from 2001 to 2011 published on population monograph of Nepal volume 1 and the Census population of 2001 and 2011 were used to estimate the population of Nepal of 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010 and 2012 (Population Monograph of Nepal, 2014). We had added the ten years males' population to calculate the crude incidence in males. Similarly, we had also added the ten years females' population to calculate the crude incidence in females. The crude incidence rate of cancer (per 100,000) in males

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and females of all sites were calculated. We have also calculated the age standardized rate of cancer by years and incidence by age groups for both males and females from 2003 to 2012. Statistical analysis was performed using SPSS (version 23.0) and Microsoft Excel 2010.

Results

The total number of cancer cases including both sexes with known age was 5,5931 over the ten years in Nepal. Female cancer cases were higher than male cancer cases. The crude incidence rate in female's cancer was also higher than the crude incidence rate in males' cancer.

Table 1. Distribution of Cancer Site in Males in Nepal From 2003 To 2012

ICD (10th)	Cancer	Cases	Freq (%)	Crude Incidence
C00	Lip	123	0.47	0.1
C01-02	Tongue	691	2.65	0.55
C07-08	Salivary glands	324	1.24	0.26
C03-06	Mouth	1027	3.94	0.82
C09-14	Pharynx	1407	5.4	1.13
C15	Oesophagus	823	3.16	0.66
C16	Stomach	2049	7.86	1.64
C17	Small intestine	101	0.39	0.08
C18	Colon	567	2.18	0.45
C19-21	Rectum and anus	729	2.8	0.58
C22	Liver	532	2.04	0.43
C23-24	Gallbladder etc.	711	2.73	0.57
C25	Pancreas	264	1.01	0.21
C30-31	Nose sinuses etc.	312	1.2	0.25
C32	Larynx	1280	4.91	1.03
C33-34	Lung (incl. trachea and bronchus)	4973	19.08	3.98
C40-41	Bone	726	2.79	0.58
C43	Melanoma of skin	946	3.63	0.76
C44	Other skin	375	1.44	0.3
C47-C49	Connective tissue	405	1.55	0.32
C50	Breast	104	0.4	0.08
C60	Penis	447	1.72	0.36
C61	Prostate	399	1.53	0.32
C62	Testis	247	0.95	0.2
C64-66,C68	Kidney etc.	347	1.33	0.28
C67	Bladder	1089	4.18	0.87
C69	Eye	224	0.86	0.18
C70-72	Brain, central nervous system	665	2.55	0.53
C73	Thyroid	366	1.4	0.29
C74-75	Other endocrine	715	2.74	0.57
C81	Hodgkin lymphoma	875	3.36	0.7
C82-85,C96	Non-Hodgkin lymphoma	555	2.13	0.44
C88,C90	Multiple myeloma	844	3.24	0.68
C91-95	Leukaemia	791	3.03	0.63
N/A		31	0.12	0.02
Total		26064	100	20.88

The number of all cancer cases by sites, frequency and crude cancer incidence in males and females throughout the ten years was also presented in table 1 and table 2 respectively. This descriptive study demonstrated that Lung (incl. trachea and bronchus) cancer was the most common cancer in males in Nepal followed by stomach and pharynx over the ten years. Similarly, Cervix uteri cancer was the most common cancer in females followed by breast, Lung (incl. trachea and bronchus) cancer over the ten years.

Table 2. Distribution of Cancer Site in Females in Nepal From 2003 To 2012

ICD (10th)	cancer	No of cases	Fre (%)	crude incidence
C00	Lip	60	0.2	0.05
C01-02	Tongue	311	1.04	0.25
C07-08	Salivary glands	175	0.59	0.14
C03-06	Mouth	449	1.5	0.35
C09-14	Pharynx	540	1.81	0.43
C15	Oesophagus	452	1.51	0.36
C16	Stomach	1,206	4.04	0.95
C17	Small intestine	53	0.18	0.04
C18	Colon	492	1.65	0.39
C19-21	Rectum and anus	602	2.02	0.47
C22	Liver	325	1.09	0.26
C23-24	Gallbladder etc.	1365	4.57	1.08
C25	Pancreas	229	0.77	0.18
C30-31	Nose sinuses etc.	255	0.85	0.2
C32	Larynx	371	1.24	0.29
C33-34	Lung (incl. trachea and bronchus)	3,126	10.47	2.46
C40-41	Bone	559	1.87	0.44
C43	Melanoma of skin	673	2.25	0.53
C44	Other skin	320	1.07	0.25
C47-C49	Connective tissue	334	1.12	0.26
C50	Breast	4,623	15.48	3.64
C53	Cervix uteri	6,541	21.9	5.16
C54	Corpus uteri	366	1.23	0.29
C56,C57.0-4	Ovary etc.	1,811	6.06	1.43
C51-52,C55,C58	Other female genital organs	156	0.52	0.12
C64-66,C68	Kidney etc.	231	0.77	0.18
C67	Bladder	309	1.03	0.24
C69	Eye	209	0.7	0.16
C70-72	Brain, central nervous system	450	1.51	0.35
C73	Thyroid	735	2.46	0.58
C74-75	Other endocrine	21	0.07	0.02
C81	Hodgkin lymphoma	1,621	5.43	1.28
C82-85,C96	Non-Hodgkin lymphoma	332	1.11	0.26
C88,C90	Multiple myeloma	58	0.19	0.05
C91-95	Leukaemia	487	1.63	0.38
Other		20	0.07	0.02
Total		29,867	100	23.54

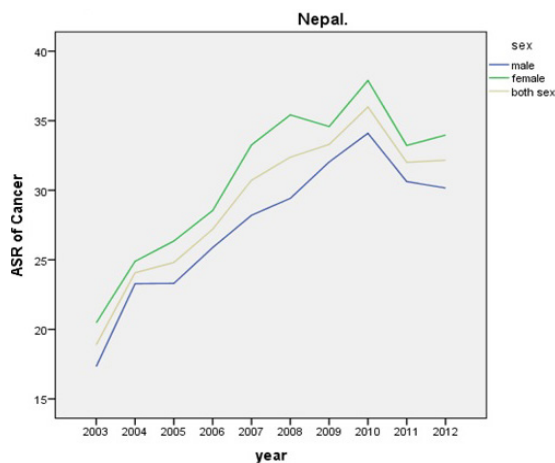


Figure 1. Age Standardized Rate of Cancer Incidence Per 100,000 for both Sex in Nepal

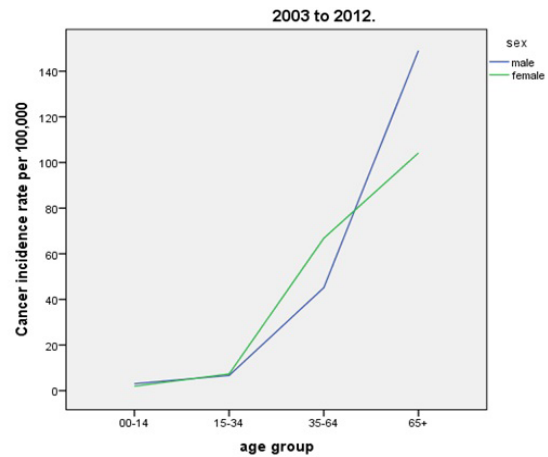


Figure 2. Crude Incidence by Age Groups in Males and Females of Nepal from 2003 to 2012

Discussion

Our study found that the three common cancers in male was Lung (incl. trachea and bronchus) (3.98 per 100,000) followed by stomach (1.64 per 100,000) and pharynx (1.13 per 100,000) throughout the ten years. A previous couple of studies in Nepal had also demonstrated that lung cancer was the leading cancer in Nepalese males (Poudel et al., 2016; Pun et al., 2015; Pradhananga et al., 2009; Binu et al., 2007). It could be because of household air pollution, and tobacco consumption (Raspanti et al., 2015; Raspanti et al., 2016) and not enough medical health education (Khathiwada et al., 2012), poor education, unmarried individuals, and Rai/Limbu/Magar ethnicity (Hashibe et al., 2010). Findings had revealed that the practice of tobacco products was high in Nepal (Sreeramareddy et al., 2011; Pandey et al., 1988). However, the exact figure of tobacco users was unknown because of unavailability of the national level data in Nepal (Subedi et al., 2013). One survey had showed that 35.5% males and 15% of females smoked tobacco products in Nepal while 31.2% of males and 4.6% of females used smokeless tobacco (Government of Nepal, 2016). Finding from Subedi et al. (2013) had revealed that the estimated deaths in Nepal, because of consumption of tobacco, were nearly 15000 per year. Tobacco attributed cancer was the main reason of death. Our study found that larynx cancer is the fourth common cancer in Nepal throughout the ten years however a previous study showed that it was the third most common cancers in males in Nepal (Pun et al., 2015; Poudel et al., 2016). Cancer of lung and larynx were also the leading cancer in the neighboring countries (India, Pakistan and Bangladesh). It could be because of higher consumption of smoking and chewing of tobacco products in males of those nations (Subedi et al., 2013; Gaur et al., 2006; Critchley et al., 2003). Nepal ranked 177 among 180 countries in terms of air quality (Kathmandu Post, 2016), which was also considered as the risk factor for lung cancer (Torre et al., 2015). The stomach cancer which was the second common cancer in males in Nepal was also increased every year from 2003 to 2012 (Poudel KK., 2016). Different factors such as dried, smoked, and salted foods were considered as higher risk factor for

gastric cancer in (Sathian et al., 2012). A national survey conducted in Nepal found that 67.5% of the total sample had consumed alcohol (WHO Report, 2004). Alcohol might also contribute to the growing number of stomach cancer in Nepal.

Similarly, our study presented that the most common three cancers in females was cervix uteri (5.16 per 100,000) followed by breast (3.64 per 100,000) and lung (2.46 per 100,000). Findings of this study were clearly in line with the previous outcomes (Pradhanange et al., 2009; Pun et al., 2015; Poudel., 2016). Due to lack of awareness concerning the human papillomavirus (HPV), cervical cancer and HPV vaccine (Johnson et al., 2014), idea of pap smear test (Ranabhat et al., 2014), poor purchasing capacity for HPV vaccination (Singh et al., 2010). The circumstances of cervix cancer will be greater than before year by year (Sathian et al., 2013). Studies had also showed that breast was the second most common cancer for females in Nepal (Pun et al., 2015; Pradhananga et al., 2009; Poudel et al., 2016). A cross sectional descriptive study performed at Kist Medical College in Kathmandu demonstrated that breast cancer was increased due to the lack of information on breast cancer, risk factors and breast screening (Shrestha, 2012). One study had also reported that poor knowledge of breast cancer risk factors, symptoms and curability, among higher secondary school students in Nepal (Bhandari et al., 2016). It could be another factor for the increment of cancer in Nepal in future. For the prevention and control of breast cancer in Nepal, breast self-analysis could be used as one of the key tools (Tara et al., 2008). The incidence rates were higher in North America, Australia/New Zealand, and Northern and Western Europe as compared to most of Africa and Asian and intermediate in Central and Eastern Europe (Torre et al., 2015).

In conclusion, this retrospective study has illustrated that the common cancers in males and females over the ten years could have been preventable. The most common cancers in males were Lung (incl. trachea and bronchus) followed by stomach and pharynx while in females the cervix uteri, breast and Lung (incl. trachea and bronchus) were the most common cancer over the ten years.

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