

RESEARCH ARTICLE

Changes in the Distribution of Cancer Incidence in Nepal from 2003 to 2013

Krishna Kanta Poudel^{1*}, Zhibi Huang², Prakash Raj Neupane³, Roberta Steel⁴

Abstract

Background: Cancer incidence data are vital for cancer control planning in any nation. This retrospective study was conducted to compare the cancer incidence of all sites between the first cancer registry report and the most recent example in Nepal. **Material and Methods:** The cases in the first (2003) and latest (2013) national cancer registry reports, accumulated by all the hospital based cancer registries in Nepal were taken for the research. The frequencies, crude incidences and age specific incidences (per 100,000) of the five major cancers were calculated for both males and females. **Result:** The most common cancer type for males in both years 2003 and 2013 was lung. Stomach was the third most common cancer in 2003 while it was the second in 2013. Similarly, the first four major cancers (cervix, breast, lung and ovary) did not change between 2003 and 2013 in females. The total cancer incidence rate increased from 12.8 in 2003 to 30.4 per 100,000 in 2013 for males and from 15.1 to 33.3 in females. **Conclusion:** The most common cancers in males in 2003 and 2013 were the bronchus and lung. Similarly, the most common cancer in females was cervix at both time points. The cancer incidence rate in females was higher than in males both in 2003 and 2013.

Keywords: Cancer- incidence- sites- sex- age- Nepal

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Introduction

Cancer is considered to be a leading cause of death not only in developed, but also in developing countries and the main factors leading to the increase in cancer were found to be, aging and growth of population (Torre et al., 2015). Both these, along with other well known risk factors such as; smoking, obesity, physical inactivity were compounded due to changing reproductive patterns of urbanization and economic prosperity. In 2012 globally, 14.1 million new cancer cases and 8.2 million deaths occurred as of GLOBOCAN. Studies had shown that nearly 57% of cases and 65% of cancer deaths had been accounted throughout the world (Torre et al., 2015). In 2012, the most common cancer found in males were; lung, prostate, colorectal, stomach and liver whereas for female the most common were; breast, colorectal, lung, cervix and stomach. Annually more than 60% of the world's total new cases of cancer occur in; Asia, Africa and Central South America and after 20 years, the incidence of cancer is expected to increase by about 70% (WHO fact sheet, 2015).

In Nepal, there were altogether seven hospital-based cancer registries up until 2012 put, from 2013 the number of hospital based cancer registries increased up-to 12 which contributed to the collection and documentation

of cancer cases throughout the country (National Cancer Registry Report, 2003), (National Cancer Registry Report, 2013). The goal of this research is to identify trends by recording and document by site, year and sex, the changes of cancer incidence in Nepal. As this study attempts to find out the real hospital-based cancer incidence in Nepal, we have calculated the crude incidence of all cancers by sites. Methodology for this research will include using available data from the first hospital based national cancer registry report (2003) and the most recent national cancer registry report (2013). As Nepal did not have the population based cancer registry, we have taken the population (denominator) from the census and cases from the hospital.

Material and Methods

This study has retrieved the data from all the hospital-based-cancer registry (B P Koirala Memorial Cancer hospital, Bhaktapur Cancer Hospital, Bir hospital, TU Teaching Hospital, Kanti Children Hospital, BP Koirala Institute of Health Science, Manipal Teaching Hospital, Shree Birendra Hospital, Civil Service Hospital, Patan Hospital, Paropakar Maternity and Women Hospital and Nepalgunj Teaching Hospital) in 2003 and 2013 of Nepal. We have added the cancer cases of 2003 together

¹Bhaktapur cancer hospital, ³B P Koirala Memorial Cancer Hospital, Bharatpur, Chitwan Nepal, ²Department of Epidemiology and Biostatistics, School of Public Health, Guangxi Medical University, China, ⁴Cavendish Square Wellington New Zealand. *For correspondence: k.poudel.08@aberdeen.ac.uk

within categories as per international classification of disease for oncology (ICD-10) published by World Health Organization (WHO, 2010). This was done to make the number comparable with the report of 2013. We have used world standard population in five years interval to adjust the age. 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 year, age, 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 predict the population of Nepal of 2003 and 2013 (Population Monograph of Nepal, 2014). The frequency and the crude incidence of all cancers of both years by sex and site were performed. The age specific incidence (per 100,000) of five major cancers for both sexes was calculated. All total cases with known age, sex and site were included in the study. All double/multiple entry cases were excluded by cross checking name, sex, address and hospital registered number of each patients. For statistical analysis, SPSS (version 23.0) and Microsoft Excel 2010 were used.

Results

Summary of total cancer cases both in years 2003 and 2013 were presented in Table 1. The cases, frequencies and the crude incidence of all cancers presenting from January 1st to December 31st in 2003 and 2013 has been shown in Table 2 and Table 3 respectively. The age specific incidence of five major cancers in males in 2003 and 2013 has also demonstrated in figure 1 and figure 2 respectively. Similarly, the age specific incidence of five major cancers

in females in 2003 and 2013 have also performed in figure 3 and figure 4 respectively. Both the result reported that cancer has increased in Nepal by both age and sex.

Discussion

Nepal did not have a hospital-based cancer registry programme until 2003 (National Cancer Registry Report, 2003). As a consequence, all cases might not be included in the first cancer registry programme which was established in 2003 and which resulted in a lower incidence rate in that year. Our study has reported that bronchus and lung cancer was the most common cancer in males both in years 2003 and 2013. The crude incidence rate of bronchus and lung was (2.2) in 2003 while it was (5.0) per 100,000 in males in 2013. Different studies had reported that lung cancer was the major cancer in males (Poudel et al., 2016; Pun et al., 2015; Pradhananga et al., 2009; Binu et al., 2007) in Nepal because of lower education, unmarried individuals and Rai/Limbu/Magar ethnicity (Hashibe et al., 2010), household air pollution and tobacco consumption (Raspanti et al., 2016; Raspanti et al., 2015), not enough medical health education (Khatiwada et al., 2012). For young people in western Nepal; smoking was a serious issue (Binu et al., 2010) which was the risk factor of lung cancer (Torre et al., 2015). However, a hospital based retrospective study in Manipal teaching hospital indicated

Table 1. Summary of Total Cancer Cases 2003 and 2013 for Both Sex in Nepal

Years	Total cases	Male	Female
2003	3251	1,488(46%)	1,763(54%)
2013	8729	4,011(46%)	4,718(54%)

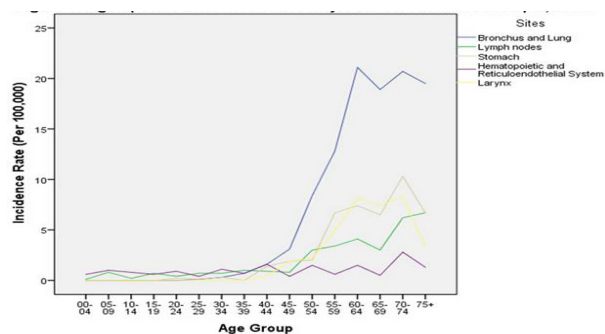


Figure 1. Age Specific Incidence of Five Major Cancers in Males in Nepal, 2003

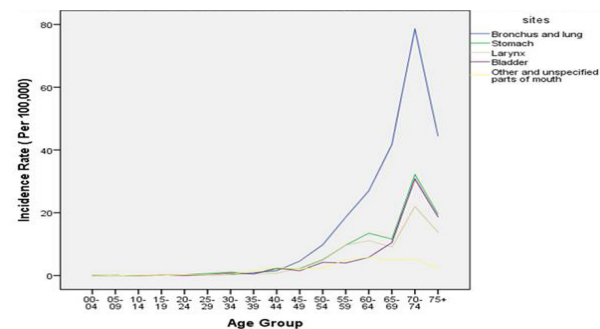


Figure 2. Age Specific Incidence of Five Major Cancers in Males in Nepal, 2013

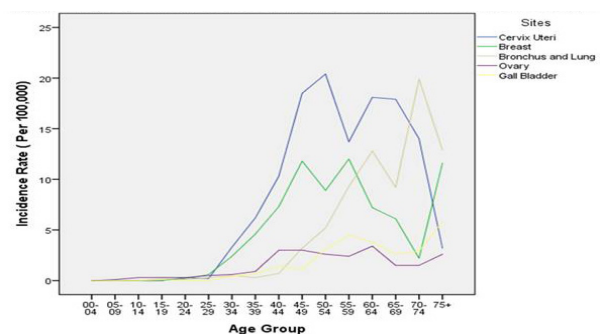


Figure 3. Age Specific Incidence of Five Major Cancers in Females in Nepal, 2003

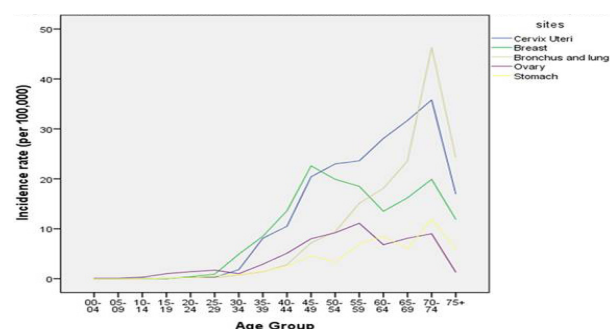


Figure 4. Age Specific Incidence of Five Major Cancers in Females in Nepal, 2013

Table 2. Distribution of Cancer Sites in Males and Females in Nepal, 2003

	Male			Female			ICD-10
	Crude Incidence (per 100,000)	Freq. (%)	Cases	Crude Incidence (per 100,000)	Freq. (%)	Cases	
Lip	0.0	0.2	4	0.1	0.5	0	C00
Base of Tongue	0.0	0.1	1	0.0	0.0	28	C01
Other and unspecified parts of tongue	0.1	0.7	13	0.2	1.9	12	C02
Gum	0.0	0.1	2	0.1	0.8	8	C03
Floor of mouth	0.0	0.1	2	0.1	0.5	7	C04
Palate	0.0	0.3	5	0.1	0.5	34	C05
Other and unspecified parts of mouth	0.1	0.6	11	0.3	2.3	12	C06
Parotid gland	0.0	0.1	2	0.1	0.8	2	C07
Other and unspecified major salivary gland	0.0	0.0	0	0.0	0.1	6	C08
Tonsil	0.0	0.2	3	0.1	0.4	3	C09
Oropharynx	0.0	0.1	1	0.0	0.2	12	C10
Nasopharynx	0.1	0.7	12	0.1	0.8	26	C11
Pyiform sinus	0.1	0.3	6	0.2	1.7	6	C12
Hypopharynx	0.0	0.0	0	0.1	0.4	8	C13
Other and ill defined sites in lip oral cavity and mouth	0.0	0.1	2	0.1	0.5	70	C14
Esophagus	0.3	1.9	34	0.6	4.7	110	C15
Stomach	0.5	3.5	62	0.9	7.4	3	C16
Small intestine	0.0	0.1	2	0.0	0.2	25	C17
Colon	0.3	2.1	37	0.2	1.7	0	C18
Rectosigmoidjunction	0.0	0.0	0	0.0	0.0	33	C19
Rectum	0.2	1.5	26	0.3	2.2	7	C20
Anus and anal canal	0.0	0.2	3	0.1	0.5	33	C21
Liver	0.2	1.1	19	0.3	2.2	39	C22
Gall bladder	0.6	4.3	75	0.3	2.6	12	C23
Other and unspecified biliary tract	0.1	0.5	8	0.1	0.8	7	C24
Pancreas	0.1	0.9	15	0.1	0.5	2	C25
Ill defined digestive organs	0.0	0.1	2	0.0	0.1	2	C26
Nasal cavity and middle ear	0.0	0.1	1	0.0	0.1	17	C30
Accessory sinus	0.0	0.1	2	0.1	1.1	90	C31
Larynx	0.2	1.0	18	0.8	6.0	0	C32
Trachea	0.0	0.0	0	0.0	0.0	262	C33
Bronchus and lung	1.5	10.0	177	2.2	17.6	0	C34
Thymus	0.0	0.0	0	0.0	0.0	3	C37
Heart, mediastinum and pleura	0.0	0.0	0	0.0	0.2	10	C38
Bones joint and articular cartilage	0.1	0.5	9	0.1	0.7	21	C40
Other and unspecified bones joints and articular cartilage	0.1	0.5	8	0.2	1.4	99	C41
Hematopoietic and Reticuloendothelial systems	0.6	3.9	69	0.8	6.7	0	C42
Skin melanoma	0.0	0.0	0	0.0	0.0	28	C43
Skin other	0.2	1.5	26	0.2	1.9	1	C44
Peripheral nerves and autonomic nervous system	0.0	0	0	0.0	0.1	15	C47
Peritoneum and retroperitoneum	0.1	0.6	11	0.1	1.0	17	C48
Connective subcutaneous and other soft tissue	0.2	1.0	18	0.1	1.1	10	C49
Breast	2.4	15.6	275	0.1	0.7	0	C50
Vulva	0.1	0.9	15	0.0	0.0	0	C51

Table 2. Continue

	Male			Female			ICD-10
	Crude Incidence (per 100,000)	Freq. (%)	Cases	Crude Incidence (per 100,000)	Freq. (%)	Cases	
Vagina	0.1	0.5	8	0.0	0.0	0	C52
Cervix uteri	3.8	25.1	442	0.0	0.0	0	C53
Endometrium	0.1	1.0	17	0.0	0.0	0	C54
Uterus	0.0	0.2	3	0.0	0.0	0	C55
Ovary	0.8	5.4	95	0.0	0.0	0	C56
Other and unspecified female genital organs	0.0	0.0	0	0.0	0.0	0	C57
Placenta	0.0	0.0	0	0.0	0.0	34	C58
Penis	0.0	0.0	0	0.3	2.3	18	C60
Prostate gland	0.0	0.0	0	0.2	1.2	9	C61
Testis	0.0	0.0	0	0.1	0.6	4	C62
Other and unspecified male genital organs	0.0	0.0	0	0.0	0.3	21	C63
Kidney	0.1	0.6	11	0.2	1.4	2	C64
Renal Pelvis	0.0	0.0	0	0.0	0.1	0	C65
Ureter	0.0	0.0	0	0.0	0.0	53	C66
Bladder	0.1	0.7	13	0.5	3.6	4	C67
Other unspecified urinary organs	0.0	0.1	2	0.0	0.3	24	C68
Eye and adexa	0.1	0.8	14	0.2	1.6	1	C69
Meninges	0.0	0.0	0	0.0	0.1	20	C70
Brain	0.1	0.6	10	0.2	1.3	3	C71
Spinal cord and other parts of CNS	0.0	0.0	0	0.0	0.2	13	C72
Thyroid	0.4	2.6	46	0.1	0.9	0	C73
Adrenal gland	0.0	0.0	0	0.0	0.0	1	C74
Other endocrine and related	0.0	0.0	0	0.0	0.1	30	C75
Other and ill defined sites	0.3	1.9	34	0.3	2	116	C76
Lymph nodes	0.4	2.9	52	1.0	7.8	43	C77
Unknown Primary site	0.3	1.7	30	0.4	2.9	0	C80
Hodgkin's disease	0.0	0.0	0	0.0	0.0	0	C81
Diffuse non hodgkin lymphoma	0.0	0.0	0	0.0	0.0	0	C83
Non hodgkin lymphoma	0.0	0.0	0	0.0	0.0	0	C85
Multiple myeloma	0.0	0.0	0	0.0	0.0	0	C90
Leukemia/lymphoid	0.0	0.0	0	0.0	0.0	0	C91
Leukemia/myeloid	0.0	0.0	0	0.0	0.0	0	C92
Other leukemia	0.0	0.0	0	0.0	0.0	0	C94
Leukemia unspecified	0.0	0.0	0	0.0	0.0	4	C95
	0.1	0.6	10	0.0	0.3	1,488	N/A
	15.1	100.0	1763	12.8	100.0		Total

that head and neck were the most common types of cancer and lung cancer was the second most common cancer in males (Bhatt et al., 2009). In 2012, approximately 1.8 million new lung cancer cases were found, accounting for almost 13% of all cancers diagnosed. The highest lung cancer incidence rates among men were found in Europe, Eastern Asia, and Northern America, and the lowest rates were in sub-Saharan Africa (Torre et al., 2015).

Our study has illustrated that lung cancer was the third common cancer in females in both years 2003 and 2013.

The crude incidence rate of bronchus and lung was (1.5) in 2003 while it was (3.5) per 100,000 in 2013 in females. Findings from the study by Pun et al (2015), Pradhananga et al (2009) and Poudel et al (2016) had also reported that lung cancer was the third most common cancer for females in Nepal. In case of women, the highest cancer occurred in Northern and Western Europe, Northern America, Eastern Asia, and Australia/New Zealand (Torre et al., 2015).

Our study has found that the first four common cancers were not changed in females both in years 2003 and 2013.

Table 3. Distribution of Cancer Sites in Males and Females in Nepal, 2013.

Sites	Male			Female			ICD-10
	Crude Incidence (per 100,000)	Freq. (%)	Cases	Crude Incidence (per 100,000)	Freq. (%)	Cases	
Lip	0.1	0.2	8	0.2	0.7	27	C00
Base of Tongue	0.0	0.0	1	0.1	0.2	7	C01
Other and unspecified parts of tongue	0.4	1.1	51	0.8	2.7	107	C02
Gum	0.1	0.2	8	0.1	0.4	17	C03
Floor of mouth	0.1	0.2	8	0.2	0.6	26	C04
Palate	0.1	0.2	8	0.2	0.5	22	C05
Other and unspecified parts of mouth	0.2	0.6	29	1.0	3.4	136	C06
Parotid gland	0.1	0.2	8	0.2	0.6	24	C07
Other and unspecified major salivary gland	0.1	0.2	11	0.1	0.5	19	C08
Tonsil	0.1	0.3	12	0.2	0.6	26	C09
Oropharynx	0.1	0.2	10	0.2	0.6	25	C10
Nasopharynx	0.2	0.5	25	0.4	1.4	57	C11
Pyiform sinus	0.1	0.2	11	0.6	2.0	82	C12
Hypopharynx	0.0	0.0	2	0.1	0.3	14	C13
Other and ill defined sites in lip oral cavity and mouth	0.0	0.1	3	0.1	0.3	14	C14
Esophagus	0.5	1.5	73	0.8	2.5	102	C15
Stomach	1.5	4.6	215	2.4	7.8	312	C16
Small intestine	0.0	0.1	5	0.1	0.3	11	C17
Colon	0.6	1.7	80	0.8	2.6	104	C18
Rectosegmoidjucnction	0.0	0.1	6	0.1	0.2	9	C19
Rectum	0.8	2.3	110	0.8	2.8	111	C20
Anus and anal canal	0.1	0.2	10	0.1	0.3	13	C21
Liver	0.8	2.3	110	0.9	3.0	121	C22
Gall bladder	1.1	3.4	161	0.7	2.3	92	C23
Other and unspecified billary tract	0.2	0.5	23	0.2	0.5	21	C24
Pancreas	0.3	0.9	41	0.4	1.2	50	C25
Ill defined digestive organs	0.0	0.1	4	0.1	0.2	9	C26
Nasal cavity and middle ear	0.2	0.5	23	0.2	0.6	23	C30
Accessory sinus	0.1	0.2	10	0.1	0.4	18	C31
Larynx	0.8	2.5	116	1.9	6.2	250	C32
Trachea	0.0	0.0	1	0.0	0.0	2	C33
Bronchus and lung	3.5	10.4	492	5.0	16.6	664	C34
Thymus	0.0	0.0	2	0.1	0.2	9	C37
Heart. mediastinum and pleura	0.0	0.1	7	0.1	0.3	11	C38
Ill defined respiratory system	0.0	0.0	2	0.0	0.0	2	C39
Bones joint and articular cartilage	0.0	0.0	0	0.0	0.0	0	C40
Other and unspecified bones joints and articular cartilage	0.3	1.0	49	0.5	1.6.0	65	C41
Hematopoietic and Reticuloendothelial systems	0.0	0.0	0	0.0	0.0	0	C42
Skin melanoma	0.2	0.6	28	0.2	0.6	24	C43
Skin other	0.2	0.6	27	0.2	0.8	31	C44
Perepheral nerves and autonomic nervous system	0.0	0.0	2	0.0	0.0	2	C47

Table 3. Continue

	Male			Female			ICD-10
	Crude Incidence (per 100,000)	Freq. (%)	Cases	Crude Incidence (per 100,000)	Freq. (%)	Cases	
Peritoneum and retroperitoneum	0.0	0.1	6	0.0	0.1	4	C48
Connective subcutaneous and other soft tissue	0.5	1.5	71	0.7	2.4	97	C49
Breast	5.1	15.4	728	0.2	0.6	24	C50
Vulva	0.3	0.8	37	0.0	0.0	0	C51
Vagina	0.2	0.6	28	0.0	0.0	0	C52
Cervix uteri	5.9	17.6	832	0.0	0.0	0	C53
Endometrium	0.4	1.2	57	0.0	0.0	0	C54
Uterus	0.1	0.3	14	0.0	0.0	0	C55
Ovary	2.5	7.4	350	0.0	0.0	0	C56
Other and unspecified female genital organs	0.1	0.4	17	0.0	0.0	0	C57
Placenta	0.0	0.0	0	0.0	0.0	0	C58
Penis	0.0	0.0	0	0.4	1.3	52	C60
Prostate gland	0.0	0.0	0	0.7	2.2	88	C61
Testis	0.0	0.0	0	0.2	0.6	25	C62
Other and unspecified male genital organs	0.0	0.0	0	0.1	0.2	8	C63
Kidney	0.2	0.7	31	0.4	1.4	57	C64
Renal Pelvis	0.0	0.0	0	0	0.0	1	C65
Ureter	0.0	0.0	0	0	0.0	2	C66
Bladder	0.7	2.1	97	1.8	5.9	238	C67
Other unspecified urinary organs	0.0	0.1	4	0	0.1	5	C68
Eye and adexa	0.2	0.5	23	0.1	0.4	18	C69
Meninges	0.1	0.3	13	0	0.1	4	C70
Brain	0.7	2.1	99	0.9	2.9	118	C71
Spinal cord and other parts of CNS	0.1	0.2	9	0.1	0.2	7	C72
Thyroid	0.9	2.7	126	0.4	1.3	52	C73
Adrenal gland	0.0	0.0	0	0	0.1	3	C74
Other endocrine and related	0.0	0.1	3	0	0.0	2	C75
Other and ill defined sites	0.4	1.1	51	0.4	1.5	59	C76
Lymph nodes	0.2	0.6	30	0.3	1.0	39	C77
Unknown Primary site	0.3	1.0	49	0.4	1.3	54	C80
Hodgkin's disease	0.1	0.4	17	0.4	1.2	48	C81
Diffuse non hodgkin lymphoma	0.0	0.0	0	0	0.0	0	C83
Non hodgkin lymphoma	0.5	1.4	66	0.8	2.7	109	C85
Multiple myeloma	0.2	0.5	25	0.1	0.4	17	C90
Leukemia/lymphoid	0.4	1.1	51	0.7	2.4	96	C91
Leukemia/myeloid	0.5	1.6	74	0.7	2.4	95	C92
Other leukemia	0.0	0.0	0	0	0.0	0	C94
Leukemia unspecified	0.1	0.4	18	0.2	0.7	30	C95
	33.3	100	4,718	30.4	100	4,011	Total

This study has illustrated that cervix uteri cancer was the most common cancer in females in both years 2003 and 2013. The crude incidence rate of cervix uteri cancer was (3.8) in 2003 while it was (5.9) in 2013. Studies had also revealed that cervix uteri was the most common cancer for females in Nepal (Poudel et al., 2016; Pun et al., 2015;

Pradhananga et al., 2009; Bhatt et al., 2009). It might be because of lack of information regarding the human papillomavirus (HPV), cervical cancer and HPV vaccine (Johnson et al., 2014), concept of Pap smear test (Ranabhat et al., 2014). Owing to not having enough knowledge and the poor purchasing capacity of HPV vaccination (Singh

et al., 2010), the cases of cervix cancer will be increased year by year and high priority should be given to manage the risk factors of cervical cancer (Sathian et al., 2013). However, one study conducted in Manipal Teaching Hospital in Nepal reported that lung cancer was the major cancer for females followed by cervix, breast, stomach and ovary (Binu et al., 2007). Nepal had less burden of human papillomavirus infection comparing with the many places of China and India. Using the HPV16/18 vaccines, almost 80% of cervical cancer in Nepal could be prevented (Sherpa et al., 2010). The incidence of cervix cases was found to be highest in sub-Saharan African, Latin America and the Caribbean, and Melanesia whereas the lowest incidence occurred in Western Asia, Australia/New Zealand, and Northern American (Torre et al., 2015).

In 2003, Lymph nodes cancer was the second most common cancer in males, however in 2013; it was not under the top five major common cancers. The incidence rate of lymph nodes was (1.0) per 100,000 in 2003 in males. Our study illustrated that breast cancer was the second most common cancer in females in both years 2003 and 2013. The incidence rate of breast cancer was (2.4) in 2003 while it is (5.1) per 100,000 in 2013. Studies had also reported that breast was the second most common cancer in females in Nepal from 2003 to 2012 (Poudel et al., 2016; Pun et al., 2015; Pradhananga et al., 2009). More than quarter of the breast cancer occurred in young females of Nepal and more aggressive biological features of tumors were found in younger women between November 1997 and October 2012. Breast cancer prevention program was essential among this people (Thapa et al., 2013). One study conducted in western Nepal had showed that research was essential to know the role of smoking in breast cancer in association with oxidative stress and antioxidant in Nepalese people (Nagamma et al., 2014). Educated women were more conscious about the knowledge of breast examination in comparison with the illiterate women (Sathian et al., 2014). 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 et al., 2012). 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 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).

Stomach cancer was the third most common cancer in 2003 in males whereas it was the second most common cancer in 2013. The crude incidence rate of stomach was (0.9) in 2003 while it was (2.4) in 2013. Out of 7212 cases from the data of B P Koirala Memorial Cancer hospitals, (7.3%) were stomach cancer (Pun et al., 2015). Similarly, another study reported that (7.5%) stomach cancers for males while the corresponding percentage of females was (4.1%) out of 4397 cases (Pradhananga et al., 2009). Perforation peritonitis was considered as a rare complication of a gastric cancer and this being the case therefore, associated with high postoperative morbidity

and mortality. Curative resection was the best treatment for the long term survival of patients (Kandel et al., 2013). Because of low gastric mucosal atrophy, the incidence of gastric cancer was predominantly low in Nepal however the people who lived in mountainous area could still be considered as a high risk population for gastric mucosal status (Miftahussurur et al., 2015). Men were almost two times higher as compared to women in stomach cancer and vary widely worldwide. Overall, incidences rates were highest in Eastern Asia particularly in Korea, Mongolia, Japan, and China, Central and Eastern Europe, and South America whereas the lowest incidence rates were found in most parts of Africa and Northern America (Torre et al., 2015). Hematopoietic and reticuloendothelial system was the fourth most common cancer in males in 2003 whereas it was not under the top five major cancers in 2013. The incidence rate of hematopoietic and reticuloendothelial system was (0.8) in 2003. Larynx cancer was the fifth most common cancer in males in 2003 but it was the third most common cancer in 2013 in males. The incidence rate of larynx was (0.8) in 2003 while it was (1.9) in 2013. Out of 7212 cases in 2012, (5.2%) were the larynx cases (Pun et al., 2015). Similarly, another study reported that 3.7% larynx cancer in males while the corresponding percentage in females was 1.3% out of 4397 cases in Nepal (Pradhananga et al., 2009). Our study illustrated that ovary was the fourth most common cancer in females in both years 2003 and 2013. The crude incidence rate of ovary was (0.8) in 2003 while it is (2.5) in 2013. A hospital based study reported that biochemical parameters and evaluation of CA-125 was important to control the ovarian cancer and to improve the survival rate (Thanpari et al., 2014).

In conclusion, the number of cancer cases was higher in 2013 than 2003. Cancer incidence was has increased by age both in males and females in Nepal. The most common cancer in males in 2003 and 2013 was bronchus and lung. Similarly, the most common cancer in females in both years 2003 and 2013 was cervix and uteri.

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