

## RESEARCH COMMUNICATION

# Multi-institution Hospital-based Cancer Incidence Data for Nepal - An Initial Report

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## Abstract

While comprehensive cancer registration data are available for some locations in India and Pakistan, the situation regarding other countries in South Asia is less clear. Only one publication with cancer incidence data is available in the literature for Nepal, for one hospital in the Western provinces. The present study was conducted to assess burden across a greater proportion of country with data from 7 major hospitals where cancer is diagnosed and treated. Data from each were transferred to the BP Koirala Memorial Cancer Hospital in Bharatpur, the National Cancer Center of Nepal, for compilation. Overall the most common site in males was the lung, followed by the oral cavity and stomach, while the first three in females were cervix uteri, breast and lung. Shifts in the the main cancers were noted with different ages, with leukemias and lymphomas in young individuals replaced by lung, oral and stomach in middle age and lung, stomach and larynx in the oldest category of males. In females the shift was to breast in young women, then cervix in middle age followed by lung in the very aged. There was also variation between hospitals, but this appeared largely due to the differences in the therapeutic modalities available in different institutions.

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## Introduction

The basis of our understanding of the cancer problem is provided by the incidence and mortality data generated by cancer registries. Within Asia there are many regional population-based registries reporting to the International Agency for Research on Cancer publication *Cancer Incidence in Five Continents* (Parkin et al., 2002; Curado et al., 2007), but there are still many countries which do not yet have reliable population-based statistics. In their absence recourse must be made of hospital-based data.

Focusing on South Asia, population- or hospital-based registries have been established for different locations in India (Yeole, 1992; Rajkumar et al., 2000; Sen et al., 2002; Nandakumar et al., 2005) and Pakistan (Bhurgri et al., 2000; 2005; 2006; Jamal et al., 2006; Zeb et al., 2008), but data for Sri Lanka, Bangladesh, Bhutan and Nepal are very limited (Mohammad and Makaju, 2006; Binu et al., 2007; Talukder et al., 2007). Estimates are available from *Globocan 2002* (Ferlay et al., 2005), but whether they are accurate is unclear. In Nepal, a system of collection of cancer incidence data from 7 major hospitals around the country was introduced in 2005, with the support of WHO. This effort has led to publication of a number of hospital based reports but the data are not available in the public domain for international comparison. The present study was therefore conducted to select incidence data for major cancers from the hospitals in question and also to focus on variation with patient age, sex and location within Nepal.

## Materials and Methods

The hospitals included in the project are: BP Koirala Memorial Cancer Hospital, Bharatpur; Bir, Tribhuvan Kanti Children's and Bhaktapur Hospitals in Kathmandu; BP Koirala Institute of Health Sciences in Dharan; and Manipal Teaching Hospital in Pokhara (see Figure 1).

All hospitals provided data on individual cancer cases from January 1st to December 31st, 2005, with sex, age, occupation, religion, diagnosis and diagnostic methods and country districts for the patients. These data were then collected for the present descriptive study.



Figure 1. Outline Map of Nepal with the Sites of Contributing Hospitals

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**Table 1. Distribution According to Institution\***

Institution	Females		Males		Total	
BP Koirala	1,197	51.2	957	46.5	2,154	49.0
Bhaktapur	522	22.3	486	23.6	1008	22.9
Bir	87	3.7	119	5.8	206	4.7
Tribhuvan	80	3.4	54	2.6	134	3.0
BP Koirala	354	15.1	348	16.9	702	16.0
Manipal	87	3.7	75	3.6	162	3.7
Kanti	13	0.6	18	0.9	31	0.7
Total	2,340	100	2,057	100	4,397	100

\*Data are numbers and percentages

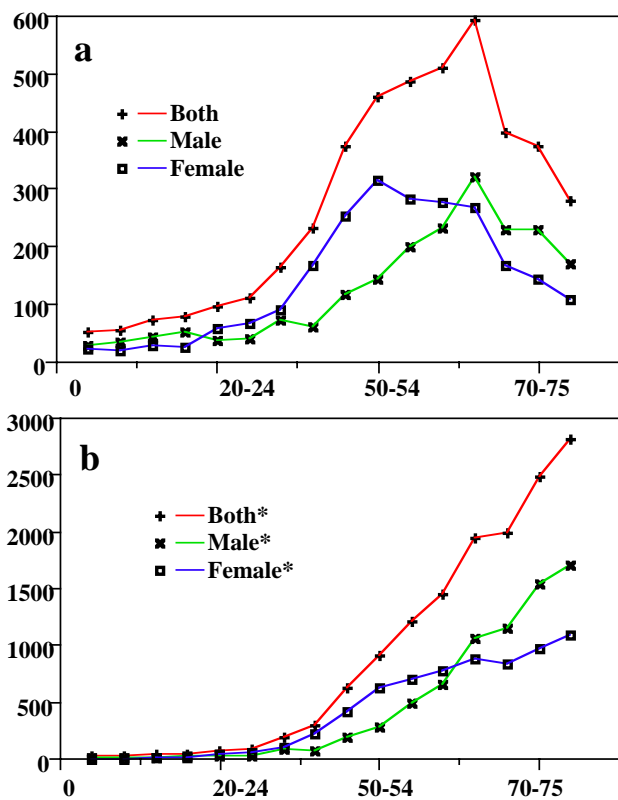
**Results**

The total cases and the different hospital contributions are summarized in Table 1. The findings for individual cancer sites are given in Tables 2 and 3, for males and females, respectively. For comparison, data from Karachi, Pakistan, and Mumbai, India are included. Overall, the most common cancer sites were found to be lung, oral cavity and stomach in males, and cervix, breast and lung in females. However, there was some variation in relative prevalence in the different hospitals.

The overall age distribution of the cases is shown in Figure 2. Variation was apparent among the age groups with regard to particular prevalence, as shown in Table 4. The age dependence of the four most prevalent cancers in males and females is illustrated in Figure 3.

**Discussion**

From the data in the present study showed lung, followed by oral cavity, larynx and stomach cancers to be the most common overall in males, and cervix, breast,



**Figure 1. Estimated Age-distributions of Cancer Cases in Nepal. a) Crude, b) Population Pyramid-adjusted**

lung and ovary in females. This is in line with the earlier data for Manipal in Nepal, where for males the leading cancer sites were reported to be lung, larynx and stomach and for females lung, cervix and breast (Binu et al., 2007).

Comparisons with India are of interest. At the Himalayan Institute of Medical Sciences (HIMS), Dehradun, situated in Uttaranchal with a low socio-

**Table 2. Percentages of the Various Cancers in Different Hospitals - Males**

	Nepalese Data					Pakistan*		India*		
	All	BP Koirala Bharatpur	Bhaktapur Kathmandu	Bir Kathmandu	Tribhuvan Kathmandu	BP Koirala Dharan	Manipal Pokhara	Karachi	Mumbai	Kolkatta
Buccal	7.8	10.7	4.5	?	?	8.6	7.9	12.8	7.1	7.4
Pharynx	4.0	5.2	3.5	?	?	2.1	4.0	2.8	4.1	-
Nasopharynx	1.9	2.9	1.2	?	?	1.1	2.7	0.8	0.5	-
Oesophagus	3.7	4.3	3.3	0.8	?	3.2	10.7	4.0	6.7	4.4
Stomach	7.5	6.5	6.0	15.1	25.9	6.0	14.7	3.6	4.6	4.9
Colon	1.6	0.9	1.2	3.4	1.9	3.2	1.3	2.2	3.0	2.6
Rectum	2.4	2.4	1.6	5.0	?	3.2	2.7	1.7	2.6	2.6
Liver	1.2	1.5	1.4	4.2	?	2.6	1.3	3.2	4.5	5.2
Gallbladder	3.7	2.0	1.4	4.2	?	2.6	2.7	0.8	1.6	1.6
Pancreas	1.0	0.9	0.6	1.7	1.9	0.6	2.7	0.5	2.2	1.6
Larynx	3.7	6.4	6.4	9.2	11.1	6.3	2.7	6.4	6.5	6.3
Trachea, lung	14.6	18.7	23.3	21.8	33.3	11.2	18.7	15.0	9.7	18.3
Prostate	1.4	1.3	1.0	3.4	?	2.0	1.3	6.0	6.9	5.2
Kidney	1.7	1.1	2.1	?	3.7	2.3	1.3	1.0	2.0	1.6
Bladder	3.3	3.7	3.3	5.9	5.6	1.1	4.0	5.6	3.8	4.3
Brain	2.0	1.5	3.5	4.2	1.9	0.6	1.3	2.0	3.7	2.0
Thyroid	1.3	0.8	1.9	1.7	?	1.4	4.0	0.4	0.7	0.7
Non-Hodgkin	4.6	4.9	5.8	4.2	?	3.7	2.7	4.6	4.4	3.6
Leukemia	5.3	5.2	6.7	1.7	1.9	5.7	1.3	2.6	3.8	2.7

\*Data from Curado et al., 2007

**Table 3. Percentages of the Various Cancers in Different Hospitals - Females**

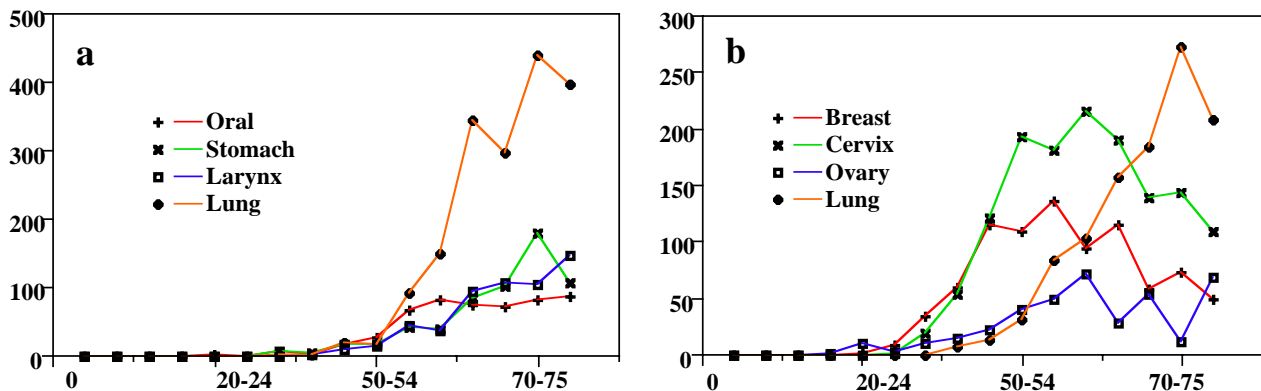
	Nepalese Data							Pakistan*		India*	
	All	BP Koirala	Bhaktapur	Bir	Tribhuvan	BP Koirala	Manipal	Karachi	Mumbai	Kolkatta	
		Bharatpur	Kathmandu			Dharan	Pokhara				
Buccal	2.2	2.8	1.6	?	?	2.8	2.3	10.1	5.5	3.8	
Pharynx	1.0	1.0	0.6	?	?	2.3	1.1	0.9	0.9	-	
Nasopharynx	0.5	0.6	0.6	?	?	0.6	?	0.3	0.2	-	
Oesophagus	1.6	1.9	1.0	?	2.5	1.7	2.3	4.5	3.4	3.1	
Stomach	4.1	2.9	3.8	5.7	13.5	5.6	6.9	1.9	1.8	3.3	
Colon	1.2	0.8	1.5	4.6	1.3	1.4	1.1	1.9	1.8	2.1	
Rectum	1.8	1.6	2.3	2.3	?	2.0	1.1	0.7	1.4	1.8	
Liver	0.7	0.4	1.3	1.1	1.3	0.6	?	1.9	2.2	3.4	
Gallbladder	5.2	4.2	5.0	4.6	7.5	9.3	3.4	2.6	2.3	7.1	
Pancreas	1.0	0.3	0.6	2.3	3.8	2.8	2.3	0.3	1.6	1.4	
Larynx	1.3	1.3	1.0	4.6	2.5	0.6	2.3	0.9	0.8	0.7	
Trachea, lung	10.8	8.0	14.2	18.4	7.5	10.5	27.6	1.9	3.1	4.3	
Breast	15.7	13.7	20.3	19.5	31.3	14.7	3.4	35.9	26.9	22.0	
Ovary	6.4	6.5	5.4	3.4	17.5	6.5	3.4	4.5	7.1	5.5	
Corpus uteri	0.9	0.5	2.1	1.1	?	0.3	1.1	3.5	2.8	-	
Cervix uteri	21.4	32.3	11.9	14.9	?	7.9	12.6	3.9	14.5	17.5	
Kidney	0.6	0.8	0.2	1.1	1.3	0.6	?	0.4	0.9	0.7	
Bladder	0.9	0.9	0.6	2.3	?	1.4	?	1.4	1.0	0.5	
Brain	1.2	0.9	2.7	2.3	?	0.3	?	1.4	2.8	1.3	
Thyroid	1.7	1.3	2.3	?	?	2.5	2.3	1.5	1.5	1.4	
NHL	2.3	2.1	2.7	1.1	?	2.8	2.3	2.7	2.9	1.8	
Leukemia	2.9	2.0	3.7	2.3	?	3.4	1.1	1.9	2.7	1.4	

\*Data from Curado et al., 2007

**Table 4. Cancers Listed in their Order of Frequency in Different Age Groups**

	0-14		15-34		35-64		>64	
	Male	Female	Male	Female	Male	Female	Male	Female
1st	LL (23.7)	Eye (27.3)	ML (15.1)	Breast (18.1)	Lung (19.4)	Cervix (26.0)	Lung (26.1)	Lung (23.2)
2nd	ML (11.8)	LL (14.5)	NHL (8.0)	Ovary (10.9)	Oral (8.0)	Breast (18.4)	Stomach (9.3)	CX (14.5)
3rd	Brain (11.8)	Bone (9.1)	Bone (7.1)	Cervix (8.5)	Gastric (7.4)	Lung (9.3)	Larynx (8.3)	Breast (6.6)
4th	Eye (10.5)	ML (7.3)	Oral (6.6)	ML (8.1)	Larynx (7.0)	Ovary (6.3)	Eso (5.4)	GB (6.3)
5th	HD (9.2)	Brain (7.3)	Gastric (5.7)	Brain (4.0)	Phar (4.4)	GB (5.5)	Oral (5.3)	Ovary (4.7)
6th	NHL (7.9)	LEU (7.3)	Rectal (5.2)	Rectal (4.0)	NHL (4.3)	Stom (4.6)	UB (4.7)	Sto (4.0)
7th	Kidney (5.3)	NHL (5.5)	Brain (4.2)	NHL (2.6)	Eso (3.6)	Oral (2.4)	Pharynx (5.4)	Eso (4.0)
8th	Bone (5.3)	HL (3.6)	LL (3.8)	ST (2.6)	UB (3.3)	NHL (1.7)	Prostate (3.6)	Oral (3.0)

GB, gallbladder; LEU, leukemia; LL, lymphoid leukemia; ML, myeloid leukemia; NHL, non-Hodgkins lymphoma; UB, urinary bladder



**Figure 1. Age-distributions of Major Cancers in Nepal. a) Male, b) Female**

economical status like that in Nepal, the top five cancer sites are in males are lung, larynx, lymph system, oesophagus and stomach, while in females they are the breast, cervix, gallbladder, ovary and oesophagus (Gaur et al., 2006). In Kolkatta, lung then buccal and breast then cervix are most important (Sen et al., 2002). Nepal has

lower prostate cancer rates than does India and Pakistan.

In the latter country, there is considerable variation in different registries, for example in Hyderabad, Lahore, Larkana, Karachi, Rawalpindi, Quetta, and Dir province (Badar et al., 2005; Bhurgru et al., 2000; 2002; 2005; 2006; Jamal et al., 2006; Zeb et al., 2008), reflecting differences

in ethnic communities and the geographical background. There is information about ethnic and social variation (Zeb et al., 2008). Another example is in India, where cancers of the buccal cavity, pharynx, larynx, oesophagus and cervix uteri are more frequently seen in non-Parsi than Parsi populations in Mumbai, while breast and endometrial cancers, as well as lymphomas and leukaemias, are more common in the latter (Yeole et al., 2001). Considerable variation is also evident with different religious faiths (Yeole et al., 2006). Whether the same type of variation is also the case in Nepal awaits future investigation with population-based data taking into account region of origin of individual patients.

Another focus should be on risk factors, for example for the buccal cavity (Bhurgri et al., 2003), to explain the trends over time documented for India (Yeole, 2007; 2008a; 2008b; 2008c; 2008d; 2008e; 2008f; Marimuthu, 2008). A long term commitment is clearly necessary if Nepal is to contribute this type of data but the present document provides compelling evidence that the situation in the country is improving and the necessary cooperation between institutes is already established.

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