

## Original Research Article

# EPIDEMIOLOGICAL TRENDS AND CHARACTERISTICS OF HEAD & NECK CANCER AT A TERTIARY CARE CENTER, ARUNACHAL PRADESH, INDIA

Amrit Debbarma<sup>1</sup>, Pallavi Boro<sup>2</sup>, Binita Singha<sup>3</sup>, Naba Jyoti Saikia<sup>4</sup>, Leena Gupta Ligu<sup>5</sup>, Jego Ori<sup>6</sup>, Mepung Liyak<sup>7</sup>, Sopai Tawsik<sup>8</sup>

<sup>1</sup>Assistant Professor, Department of Otorhinolaryngology, Tomo Riba Institute of Health & Medical Sciences (TRIHMS), Naharlagun, Arunachal Pradesh, India.

<sup>2</sup>Assistant Professor, Department of Community Medicine, Tomo Riba Institute of Health & Medical Sciences (TRIHMS), Naharlagun, Arunachal Pradesh, India.

<sup>3</sup>Associate Professor, Department of Pharmacology, Tomo Riba Institute of Health & Medical Sciences (TRIHMS), Naharlagun, Arunachal Pradesh, India.

<sup>4</sup>Statistician, Department of Community Medicine, Tomo Riba Institute of Health & Medical Sciences (TRIHMS), Naharlagun, Arunachal Pradesh, India.

<sup>5</sup>Assistant Professor, Department of Radiotherapy and Oncology, Tomo Riba Institute of Health & Medical Sciences (TRIHMS), Naharlagun, Arunachal Pradesh, India.

<sup>6</sup>Assistant Professor, Department of Otorhinolaryngology, Tomo Riba Institute of Health & Medical Sciences (TRIHMS), Naharlagun, Arunachal Pradesh, India.

<sup>7</sup>Scientist B (Medical), Population Based Cancer Registry, Tomo Riba Institute of Health & Medical Sciences (TRIHMS), Naharlagun, Arunachal Pradesh, India.

<sup>8</sup>Principal Investigator, Population Based Cancer Registry, Joint Director of Directorate Medical Education, Arunachal Pradesh, India.

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**Corresponding Author:**

**Dr. Mepung Liyak**  
Scientist B (Medical), Population Based Cancer Registry, Tomo Riba Institute of Health & Medical Sciences (TRIHMS), Naharlagun, Arunachal Pradesh, India.  
Email: chaanuhliyak@gmail.com.

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**ABSTRACT**

**Background:** Head and neck cancers are major public health problems, which can be detected much earlier by various screening methods. Head and neck cancers in India accounted for 30% of all cancers in males except Dibrugarh in Assam (49.6%). Since, no much study have been done on Head and Neck Cancers (HNCs) from this part of the country, this study was conducted to analyse the characteristics and trends of the different HNCs in a Tertiary Care Centre of Arunachal Pradesh, India.

**Materials and Methods:** This is a retrospective observational study conducted in Tomo Riba Institute of Health and Medical Sciences, Naharlagun after obtaining institutional IEC & SRC clearance. Total 536 patients (370 males and 166 female) of head and neck (HNC) were reported in the Population based Cancer Registry (PBCR). The database collected from the PBCR (consists of 8 districts of Arunachal Pradesh) web portal included demographic and clinicopathological information, including age, sex, year of diagnosis, site and types of cancer, histopathological appearance and survival time. Patients were classified on the basis of primary histology morphology (PHM) into squamous cell carcinoma, and others. From mortality reports we calculated the median survival of the patients.

**Results:** Our study showed that the male: female ratio was 2.2:1. Out of the 8 districts of Arunachal Pradesh, Papumpare district reported the highest incidence (44%) and mortality (50%) due to HNC. The median days of survival were 283days or 9.43 months. The commonest age group showing the highest incidence of HNC was the elderly from 61 years and above with a total of 121 cases (22.5%) followed by the age group from 56-60 years (17.7%). Esophageal cancer was the commonest cancer among these two age groups. Squamous cell carcinoma also showed the highest mortality contributing 47% of all the deaths registered.

**Conclusion:** Esophageal cancer was the commonest cancer among these two age groups in our study. The burden of HNC is high, especially among the male population. Further research and policies on improving the uptake of

available cancer screening are required for better cancer control and prevention.

**Keywords:** Head and Neck Cancers (HNCs), Pyriform Sinus (PFS), Primary Histology Morphology (PHM), Esophagus Cancer, Squamous Cell Carcinoma, Mortality.

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## INTRODUCTION

Head and neck cancers are major public health problems, which can be detected much earlier by various screening methods and early detection of cancer and precancerous lesions increases the chances for successful treatment.

Head and neck cancers (HNCs) are malignancies of upper aero-digestive tract, oral cavity, nasal cavity, pharynx, hypopharynx, larynx, paranasal sinuses, thyroid and salivary glands.

HNCs can cause aesthetic deformity as well as loss of function in the most vulnerable region of the body lowering the self-esteem among the patients.

Head and neck cancers in India accounted for 30% of all cancers in males except Dibrugarh in Assam (49.6%). In females they constitute 11 to 16% of all sites of cancers.<sup>[1]</sup> In India, highest number of lives lost is due to oral cancer, followed by lungs, esophagus and stomach.<sup>[2]</sup>

Overall, 57.5% of global head and neck cancers (excluding esophageal cancers) occur in Asia especially in India, for both sexes.<sup>[3]</sup> Over 200,000 cases of head and neck cancers occur each year in India. Nearly 80,000 oral cancers are diagnosed every year in our country.<sup>[4]</sup>

Head and neck cancer in India has distinct demographic profile, risks factors, food habits, family and personal history.<sup>[5]</sup>

Tongue and mouth cancers in males contribute to more than one third of the total cancer in India except Dibrugarh where hypopharynx (34.5%) was the major contributor and among females mouth cancer was the leading cause.<sup>[6]</sup>

Chewing of tobacco, betel quid, & areca-nut, consumption of alcohol are the most important risk factors of HNCs, others includes poor oral hygiene and HPV-16 infection. The prevalence of current tobacco use is 45.5%, higher for the smokeless form (39.3%) than the smoked form (22.7%) in Arunachal Pradesh.

In the north-east India, oropharyngeal carcinoma is the most commonly occurred (28.62%) sub sites of HNCs followed by oesophageal carcinoma (19.41%) and the commonest histological type seen is SCC comprising of 97.5%.<sup>[7,8]</sup>

Males are affected more than females. This maybe due to tobacco chewing, smoking and consumption of panmasala (flavouring agents taken along with betel leaf and betel-nut).<sup>[9]</sup>

Since, no much study have been done on Head and Neck Cancers (HNCs) from this part of the country, this study was conducted to analyse the characteristics and trends of the different HNCs in a Tertiary Care Centre of Arunachal Pradesh, India.

## MATERIAL AND METHODS

This is a retrospective observational study conducted in Tomo Riba Institute of Health and Medical Sciences, Naharlagun after obtaining institutional IEC & SRC clearance.

The data relevant to our study objectives were obtained from Regional PBCR data. The study duration was four years. PBCR catchment area consists of 8 districts of Arunachal Pradesh namely Papumpare, Lower Subansiri, West Siang, Upper Subansiri, Kurung Kumey, East Kameng, West Kameng, Tawang. The study population comprised of all the patients reporting to regional PBCR from January 2018 till December 2022. The database collected from the PBCR web portal included demographic and clinic-pathological information, including age, sex, year of diagnosis, site and types of cancer, histopathological appearance and survival time. Patients were classified on the basis of primary histology morphology (PHM) into squamous cell carcinoma, and others. From mortality reports we calculated the median survival of the patients.

### Statistical Analysis

Data collected were entered in Microsoft excel software and tables, graphs, and charts were prepared. Data analysis was performed using simple statistical methods like percentages and proportions.

## RESULTS

Total 536 patients (370 males and 166 female) of head and neck (HNC) were reported in the Population based Cancer Registry (PBCR), Naharlagun, Arunachal Pradesh, India during these 4 years of study period. The male: female ratio was 2.2:1. Out of the 8 districts of Arunachal Pradesh, Papumpare district reported the highest incidence (44%) and mortality (50%) due to HNC. [Table 1]

Year wise distribution shows a decline in the incidence of HNC from 2018 to 2022 but the mortality trend was variable during the four-year study period. [Figure 1]

The median days of survival was 283days or 9.43 months (Min 0 days and max 4119 days)

The commonest age group showing the highest incidence of HNC was the elderly from 61 years and above with a total of 121 cases (22.5%) followed by the age group from 56-60 years (17.7%). Esophageal cancer was the commonest cancer among these two age groups. [Table 2]

Esophagus was the most common site for HNC (27.6%). Nasopharynx, pharynx and Pyriform sinus (PFS) being the second commonest site followed by oral cavity, larynx and thyroid. Among males

esophageal cancer was the commonest followed by Nasopharynx, pharynx and PFS, larynx and oral cavity while in females thyroid was the most commonest site followed by esophagus and oral cavity. [Figure 2]

Histopathological pattern showed Squamous cell carcinoma as the commonest type comprising of 47.9% of all the cases followed by Un-differentiated carcinoma (12.5%). Squamous cell carcinoma also showed the highest mortality contributing 47% of all the deaths registered. [Table 3]

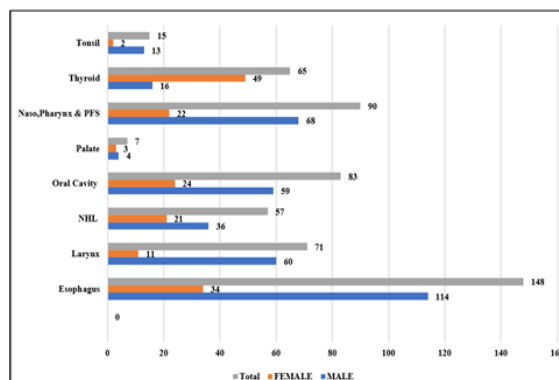


Figure 2: Incidence of various types of HNC with gender distribution

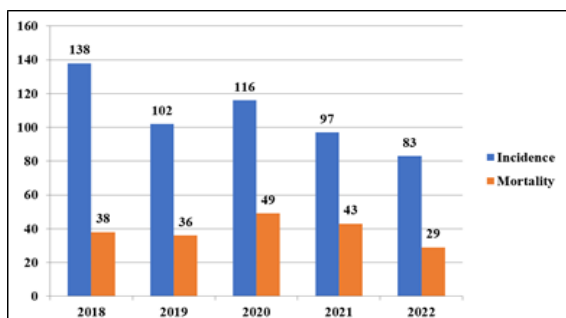


Figure 1: Year wise total (Incidence & Mortality)

Table 1: District wise Incidence and Mortality of HNC

DISTRICTS	INCIDENCE				MORTALITY			
	Male	Female	Total	%	Male	Female	Total	%
Papumpare	162	73	235	44	71	27	98	50.3
Lower Subansiri	57	32	89	17	25	4	29	14.9
West Siang	36	21	57	11	13	2	15	7.7
Upper Subansiri	34	8	42	7.8	11	3	14	7.2
KurungKumey	32	7	39	7.3	11	2	13	6.7
East Kameng	15	14	29	5.4	12	1	13	6.7
West Kameng	18	6	24	4.5	6	4	10	5.1
Tawang	16	5	21	3.9	3	0	3	1.5
<b>Total</b>	<b>370</b>	<b>166</b>	<b>536</b>		<b>152</b>	<b>43</b>	<b>195</b>	

Median survival of the cancer patients

Median	Max	Min
283.00	4119	0

Median Days of survival = 283 days or 9.43 months (Min 0 days and max 4119 days)

Table 2: Age- distribution of various HNC

Age Group	Esophagus	Naso Pharynx & PFS	Oral Cavity	Larynx	Thyroid	NHL	Tonsil	Palate	Total	%
01-05	0	0	0	0	0	0	0	0	0	0
06-10	0	0	0	0	0	1	0	0	1	0.18
11-15	0	0	0	1	1	1	0	0	3	0.55
16 - 20	0	2	0	0	3	2	0	0	7	1.3
21 - 25	0	1	1	1	4	2	0	0	9	1.6
26 - 30	0	6	2	2	8	2	1	1	22	4.1
31 - 35	0	6	4	2	5	4	0	0	21	3.9
36 - 40	12	14	6	3	12	5	0	0	52	9.7
41 - 45	15	12	9	7	5	6	1	0	55	10.2
46 - 50	29	10	13	6	8	7	4	2	79	14.7
51 - 55	26	11	14	7	7	5	1	0	71	13.2
56 - 60	23	15	17	18	4	14	2	2	95	17.7
>60	43	13	17	24	8	8	6	2	121	22.5
<b>Total</b>	<b>148</b>	<b>90</b>	<b>83</b>	<b>71</b>	<b>65</b>	<b>57</b>	<b>15</b>	<b>7</b>	<b>536</b>	

Table 3: Histopathological types of HNC cancers (Incidence and Mortality)

TYPES	INCIDENCE (year wise)							MORTALITY (year wise)	
	2018	2019	2020	2021	2022	Total (2018-2022)	%	Total (2018-2022)	%

						2022)		2022)	
Squamous Cell Carcinoma	72	31	61	59	34	257	47.9	92	47
Carcinoma Undifferentiated	17	19	10	6	15	67	12.5	30	15.3
Squamous Cell Epithelioma	14	22	14	3	10	63	11.8	52	26.6
Non-Hodgkin Lymphoma	15	9	20	9	9	62	11.6	3	1.5
Papillary Carcinoma	12	13	6	11	10	52	9.7	0	0
Adenocarcinoma	3	2	2	5	1	13	2.4	7	3.5
Epidermoid Carcinoma, Keratinizing	1	4	1	0	0	6	1.1	7	3.5
Medullary Carcinoma	3	0	0	1	0	4	0.7	0	0
Spindle Cell Carcinoma	0	1	1	0	1	3	0.6	1	0.5
Carcinoma, Anaplastic	0	0	0	1	0	1	0.2	0	0
Chondrosarcoma	0	0	0	1	0	1	0.2	1	0.5
Follicular Carcinoma	0	0	0	0	1	1	0.2	0	0
Hodgkin Lymphoma	0	0	0	1	0	1	0.2	0	0
Hurthle Cell Carcinoma	0	0	0	0	1	1	0.2	0	0
Malignant Lymphoma, Undifferentiated Cell Type (Obs)	0	1	0	0	0	1	0.2	0	0
Parafollicular Cell Carcinoma	1	0	0	0	0	1	0.2	0	0
Rhabdomyosarcoma	0	0	1	0	0	1	0.2	1	0.5
Verrucous Carcinoma	0	0	0	0	1	1	0.2	1	0.5
Total	138	102	116	97	83	536		195	

## DISCUSSION

There is a high incidence of cancers in the North-eastern region, the prognosis and survival for cancers were also found to be worse in these States and the proportion of cases exhibiting distant metastasis at diagnosis was found to be higher.<sup>10</sup> A high prevalence of tobacco use, both smoked and smokeless, is noted in the NE region.<sup>[11]</sup> According to various studies, the prevalence of HNCA with respect to total body malignancies varies from 9.8% to 42.7%.<sup>[7,8]</sup>

In India, one in 33 males and one in 107 females are at risk of developing HNC. The highest cumulative risk was reported among the northeastern region male population (1 in 26 was at risk of developing HNC). This was followed by northern (1 in 30), central (1 in 31), southern (1 in 35), western (1 in 36) and eastern (1 in 47). For other anatomical sites, the cumulative risk was high for mouth cancer followed by tongue.<sup>[12]</sup>

In our study the male: female ratio was 2.2:1 which was lower than the studies conducted by Siddiqui et al,<sup>[13]</sup> and Abhinandan et al,<sup>[14]</sup> where the ratio observed were 3.1:1 and 2.9:1 respectively. But in the study conducted by Thakur et al<sup>8</sup> found that the female showed higher incidence of malignancy with a male to female ratio of 0.96:1.

The most common age group was from 61 years and above (22.5%) followed by the age group from 56-60 years (17.7%). which is similar to the study done by Abhinandan et al.<sup>[14]</sup> According to many other literature<sup>7,8</sup>HNC is most common in the 6th and 7th decades of life but Shunyu et al,<sup>[15]</sup> observed that 4th decade was the most common age group in their study.

Esophagus was the most common site for HNC (27.6%) in our study. According to a survey on cancers in Arunachal Pradesh, oesophageal cancer (7.7% in males; 2.8% in females) followed by lung (6.5% in males; 3.9% in females) constituted the leading sites in both the genders.<sup>[16]</sup> The major risk factors for oesophageal cancer was found to be betel

nut chewing in a study conducted in Assam.<sup>[17]</sup>

While high use of very spicy food and hot beverages in Mizoram was thought to be a contributing factor for the higher incidence of esophageal cancer in that region.<sup>178</sup> In other studies by Thakur et al,<sup>[7]</sup> Abhinandan et al,<sup>[14]</sup> and Chauhan et al<sup>19</sup>oral cavity was the commonest followed by Cancer in oesophagus.

The histopathological pattern in our study showed most of the HNC was Squamous cell carcinoma similar to Siddiqui et al,<sup>[20]</sup> Thakur et al,<sup>[7]</sup> and Abhinandan et al,<sup>[14]</sup> Year wise distribution showed a decline in the incidence of HNC from 2018 to 2022 but the mortality trend was variable during the four-year study period. In a study conducted by Siddiqui et al,<sup>[20]</sup> revealed a steady increase in the total cases of HNC in their region. The results of another study by Elango et al,<sup>[21]</sup> suggested an overall reduction in the incidence of head and neck cancers in both urban and rural community.

Indian PBCRs survival studies have reported low survival in patients with oral cavity cancer,<sup>[22]</sup> as compared to the United States and Europe.<sup>[23,24]</sup>

There is a dire need to develop and implement cost-effective strategies for cancer prevention and control through early detection and timely treatment. PBCRs will help in the monitoring of these activities. There is a pressing need to strengthen the tobacco control programme in India. The National Tobacco Quit Line services are available in different regions of India, offering cessation services in regional languages.<sup>[25,26]</sup> Raising cancer and risk factor awareness in the community will support prevention activities. School education programmes are effective in raising cancer awareness in the community.<sup>[27]</sup>

Through strategies for addressing the knowledge gap, strengthening infrastructure, supporting human resources in local health facilities, spreading awareness and promoting community-based approaches, it would be possible to target specific cancers at the local, State and regional level for North-East India.

## CONCLUSION

Esophageal cancer was the commonest cancer among these two age groups in our study. The burden of HNC is high, especially among the male population. Squamous cell carcinoma also showed the highest mortality contributing 47% of all the deaths registered. Also, strengthening early detection services is required. Further research and policies on improving the uptake of available cancer screening are required for better cancer control and prevention.

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