

2021

Profile of Cancer and Related Health Indicators in the North East Region of India



Profile of Cancer and Related Health Indicators in the North East Region of India



ICMR – National Centre for Disease Informatics and Research, Bengaluru

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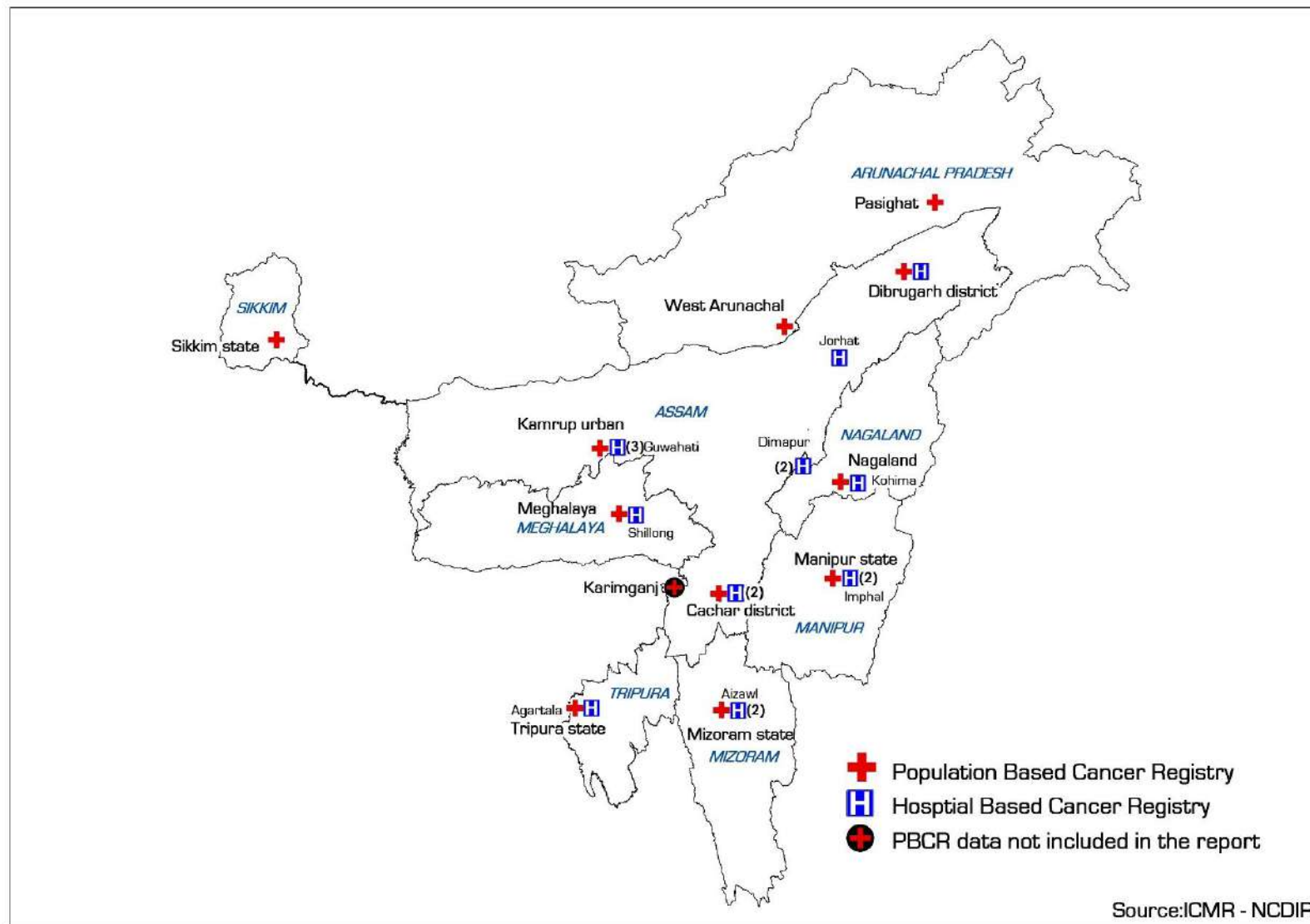
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Network of PBCRs and HBCRs in North East India



Executive Summary

About NCRP

The National Cancer Registry Programme (NCRP) has been an integral part of cancer surveillance in the country since 1981. The ICMR - National Center for Disease Informatics & Research (NCDIR) at Bengaluru is the managing and co-ordinating institute and provides the necessary technical, financial and logistic support to the NCRP. There has been a steady increase in the number of registry sites over the years. At present, NCRP is functioning through a network of 238 Hospital based Cancer Registries (HBCRs') and 38 Population Based Cancer Registries (PBCRs'). The PBCR has a range of sources of registrations (hospitals/laboratory and diagnostics centres/ peripheral health centres and hospices) within a well-defined geographic area. The HBCR compiles information on cancer cases from the concerned departments within a hospital. The registry provides comprehensive coverage in all the Northeast Region's eight states through twelve PBCRs' and fifteen HBCRs'. The NCRP has played a vital role in estimating and monitoring the incidence, mortality, patterns and projected number of cancer cases, evaluate the quality of care and cancer control programmes and essential inputs for programme, policy and research.

NER report of 2012-2016

The NER report of 2012 to 2016 includes cancer data compiled by eleven PBCRs in all the eight states, and seven HBCRs in four states (Assam, Manipur, Mizoram and Tripura) in the region. The report presents a state-wide cancer profile based on a pooled analysis of PBCR and HBCR data, and state-wise cancer profile estimated from PBCR data. The state-wide report of pooled data also includes analysis of cancer incidence for specified districts-Imphal West (Manipur), Aizawl (Mizoram), East Khasi Hills (Meghalaya) and Papumpare (Arunachal Pradesh). The state-wise presentation of cancer data is supported by a preceding description of relevant health indicators obtained from reliable data sources. The health indicators include socio-demographic profile, behavioural and metabolic risk factors, health-seeking behaviour and health system status in terms of infrastructure and medical certification of cause of death. While these health indicators could determine the cancer incidence, type and disease outcome, it provides further scope for planning cancer-directed planning and control strategies and strengthening the health system. The cancer data for each state is based on PBCR data analysis and is presented registry wise for those states having more than one PBCR. The cancer data in this report is a subset of the Report of National Cancer Registry Programme 2020.

Key findings

- The highest age-adjusted cancer incidence rate in males (269.4 per 100,000) has been recorded in the Aizawl district in Mizoram, among females (219.8 per 100,000) in Papumpare district, Arunachal Pradesh, which happens to be the highest in the region and the country.
- In males, the leading sites include cancer of the oesophagus (13.6%) followed by lung (10.9%), while in females, the breast is the leading site (14.5%), followed by the cervix uteri (12.2%).
- The probability of developing any cancer over a lifetime is highest in Kamrup urban (1 in every 4 males and 1 in every 6 females). In males, the probability of developing oesophageal cancer (1 in every 54 males) is highest, while in females, it is breast cancer (1 in every 76 females).
- The proportion of tobacco-related cancer sites is 49.3% in males and 22.8 % in females.
- Less than one-third of breast, cervix, head and neck, stomach and lung cancer is localized at the time of diagnosis.
- The age-specific incidence rate in both genders is highest in 70 to 74 years in most of the registry sites.
- The proportion of cancer patients seeking treatment outside NER is highest for Sikkim (95.3%) followed by Nagaland (58.1%).
- The projected number of cancer cases for 2020 was calculated to be 50317, while for the year 2025, is estimated to be 57,131.
- In all the states, the age-adjusted incidence is higher in males than females except in Manipur and Sikkim.
- Among females in Arunachal Pradesh and Tripura, the age-specific incidence rate is highest in the 60-64 years age group, unlike other registry sites where maximal rates are recorded in higher age groups.
- The most common leading sites in males include cancer of the oesophagus, lung and stomach.
- Cancer of the gall bladder is observed to be one of the top five leading cancer site among women in Assam, and there is a significant increase in gall bladder cancer incidence in Kamrup urban.
- In females, cancers of the breast and cervix are the first leading sites in most registry sites, except for stomach cancer in West Arunachal and oesophageal cancer in Meghalaya.
- The case-fatality ratio is higher in males than in females.

The report highlights that cancer continues to be a major public health concern in the region. The findings call for proactive initiatives from all concerned stakeholders to assess the efficacy of existing measures and plan and develop evidence-based strategies to address the region's growing cancer burden. This report should be able to provide a background to develop a comprehensive cancer prevention and control plan for the entire North East Region.



Chapter 1: Cancer Profile of North-East India

1.1 The North East Region



The North eastern region of India comprises eight states: Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura.



1.2 Number of Cancers cases - Reporting years: 2012 - 2016

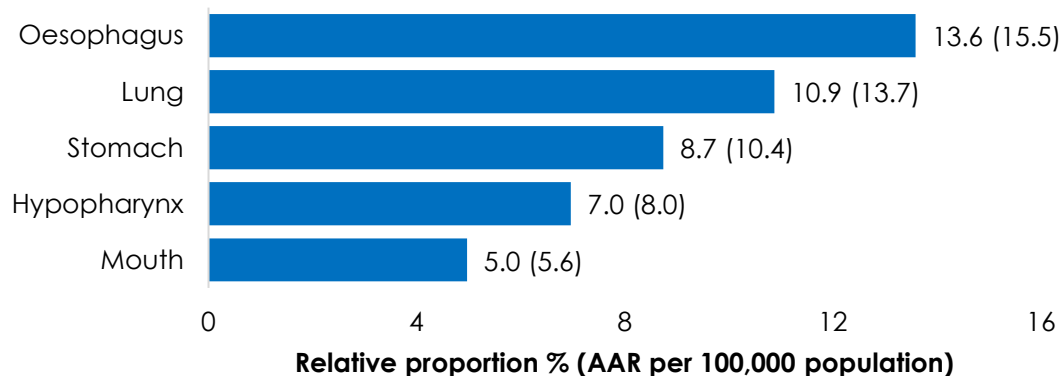
Population Based Cancer Registry	Number of cancer cases registered		
	Males	Females	Total
Assam			
Cachar district	4663	3943	8606
Dibrugarh district	2535	2238	4773
Kamrup urban	6223	4790	11013
Manipur state	3702	4500	8202
Mizoram state	4323	3736	8059
Sikkim state	1172	1131	2303
Meghalaya	4688	2832	7520
Tripura state	6559	4914	11473
Nagaland	1403	992	2395
Arunachal Pradesh			
West Arunachal	1222	1171	2393
Pasighat	321	303	624
Total cancer cases	36811	30550	67361

A total of 67,361 cancer cases have been reported from 11 PBCRs of 8 states from 2012-2016. Tripura PBCR (11,473 cancer cases) reported the highest number of cancers followed by Kamrup urban (11,013 cancer cases).

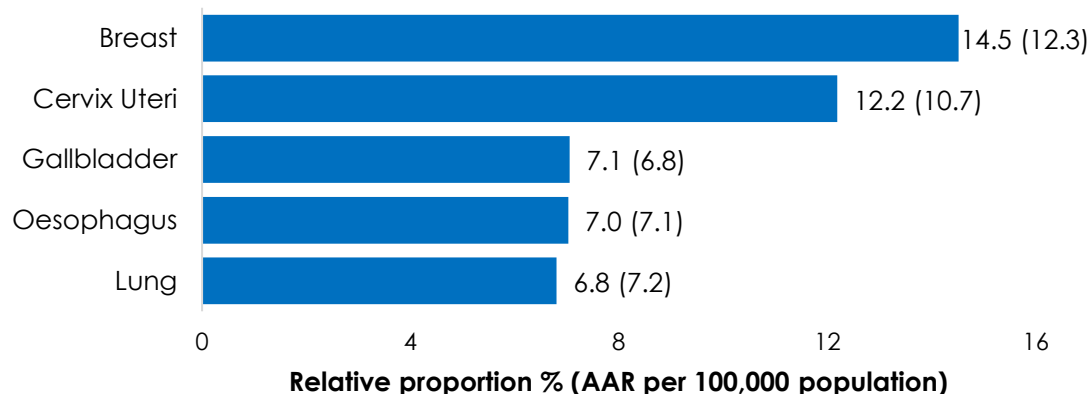


1.3 Leading cancer sites: pooled results for NER

Males



Females

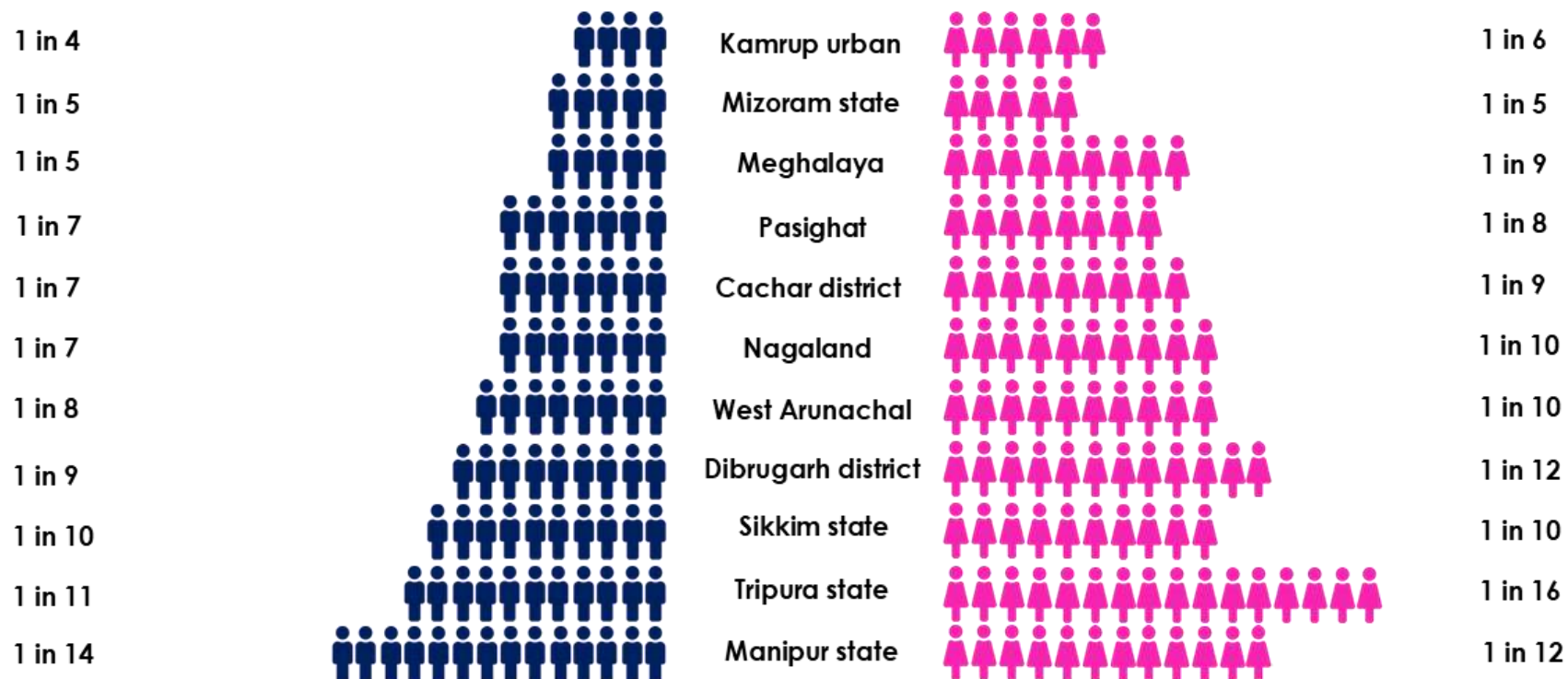


Across North East Region, the proportion of oesophageal cancer (13.6%) is highest among males, followed by lung cancer (10.9%) and stomach cancer (8.7%). In females, the breast is the leading cancer site (14.5%) followed by cervix uteri (12.2 %) and gall bladder (7.1%).





1.4 (a) Probability of One in Number of persons developing cancer in 0-74 years of age – All sites of cancer



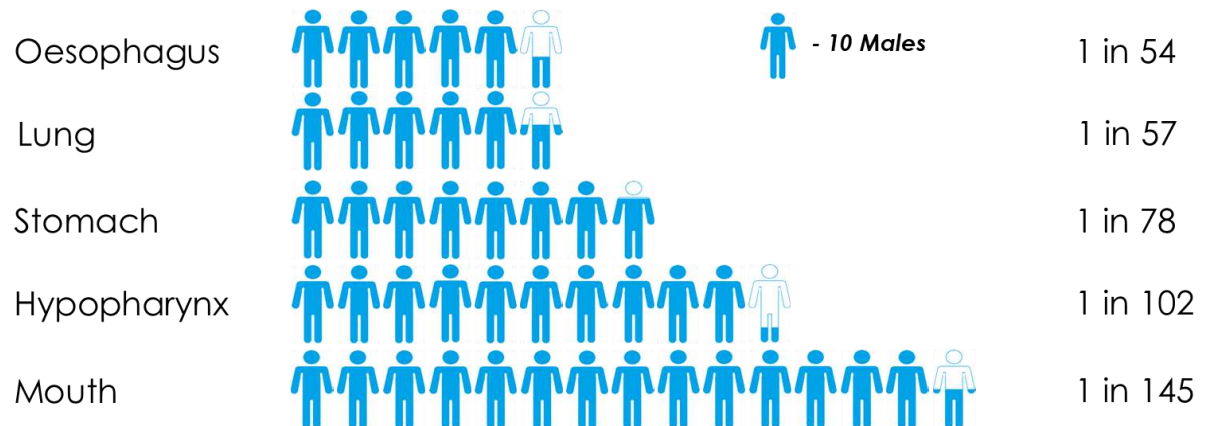
The probability of developing any type of cancer over a lifetime is found to be highest in Kamrup urban (1 in every 4 males and 1 in every 6 females) followed by Mizoram state (1 in every 5 males and 1 in every 5 females) and Meghalaya (1 in every 5 males and 1 in every 9 females).



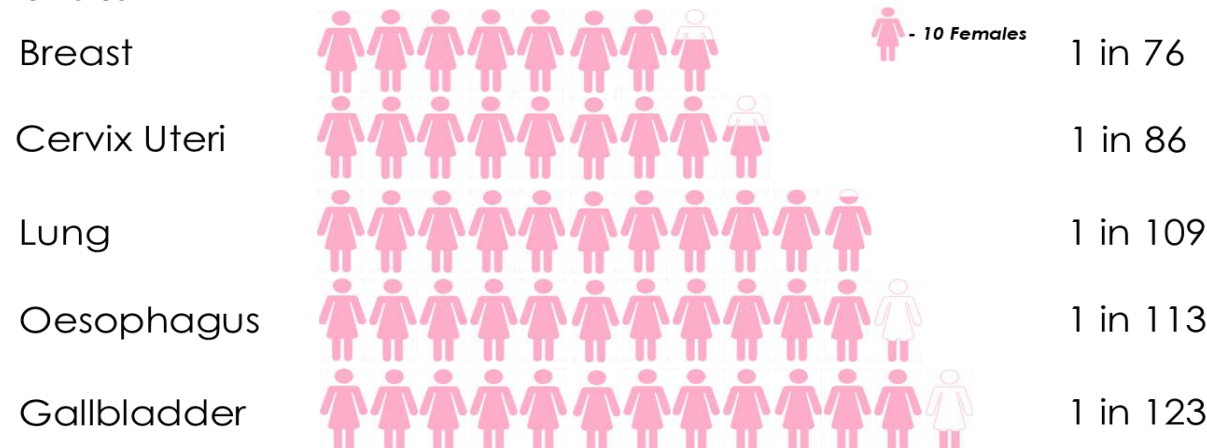


1.4 (b) Probability of One in Number of persons developing cancer in 0-74 years of age – Leading sites of cancer according to pooled analysis

Males



Females



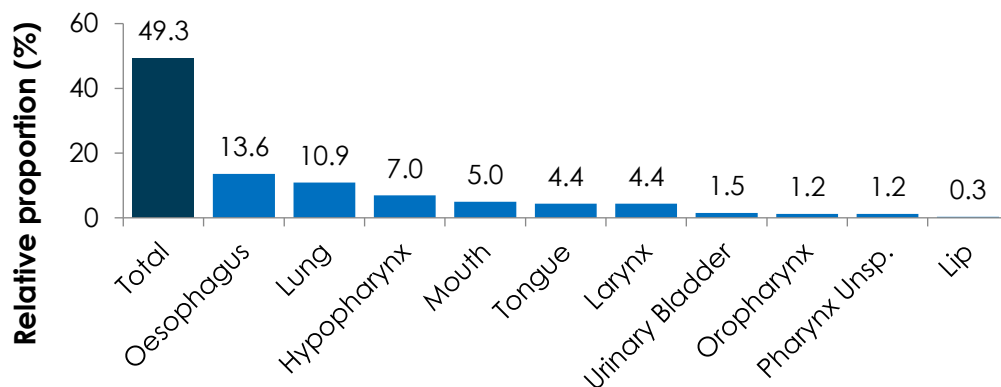
In relation to cancer sites, in males, the probability of developing oesophageal cancer (1 in every 54 males) is highest followed by lung cancer (1 in every 57 males) and stomach cancer (1 in every 78 males). In females, the probability of developing breast cancer (1 in every 76 females) is the highest followed by cancer of cervix uteri (1 in every 86 female) and lung cancer (1 in every 109 females).



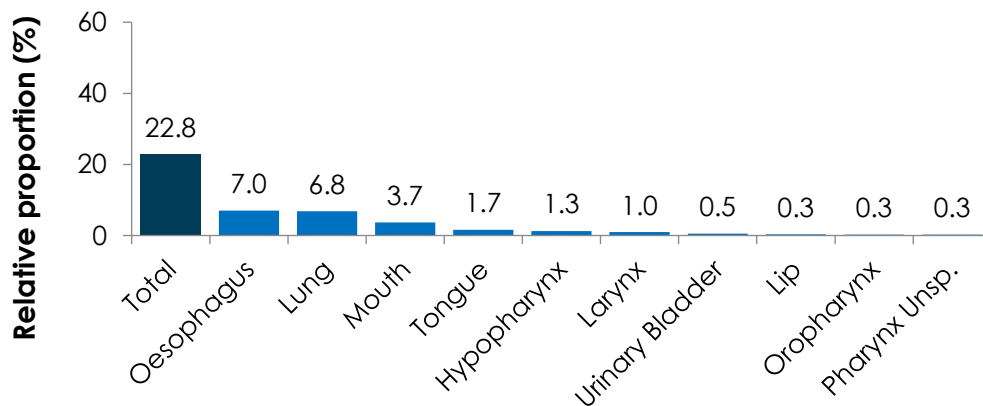


1.5 Relative Proportion (%) of Cancer Sites Associated with the Use of Tobacco

Males



Females

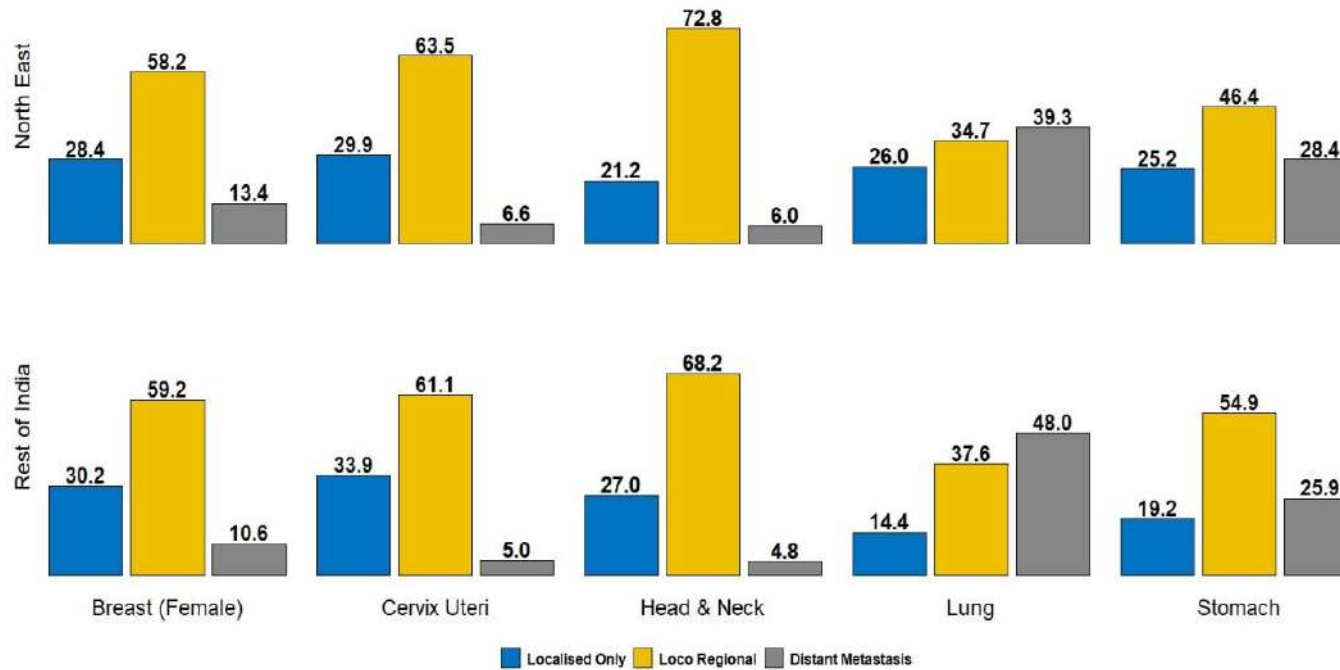


Nearly half (49.3%) of cancers in males and close to one-fourth (22.8 %) in females are tobacco use related sites. Among these, oesophagus (13.6% in males; 7.0 % in females) followed by lung (10.9% in males; 6.8% in females) constitute the leading sites.





1.6 Clinical extent of disease at the time of diagnosis for selected anatomic sites - HBCR



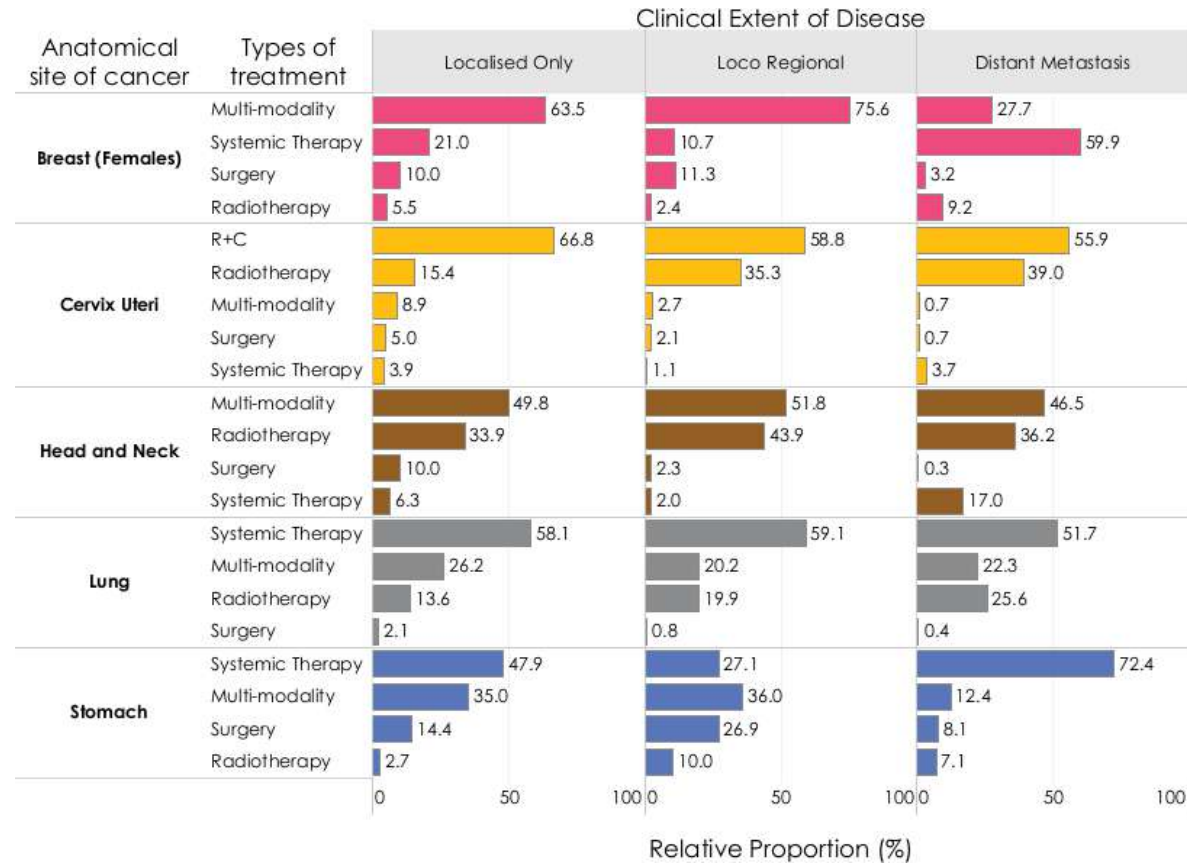
Cases only treated at the reporting institution.

The proportion of cancers diagnosed at the stage of distant metastasis is higher for head & neck cancer (72.8%), followed by cancer of cervix uteri (63.5%), breast cancer (58.2%), and stomach cancer (46.4%). For lung cancer, 39.3% and 34.7% of cases are reported to be at loco-regional and distant metastasis stages, respectively, at the time of diagnosis. Only one-fourth of cancer cases are reported at a localised stage at the time of diagnosis for breast cancer (28.4%), cancer of cervix uteri (29.9%), head & neck (21.2%), lung (26.0%) and stomach (25.2%).





1.7 Relative Proportion of types of treatment according to clinical extent of disease for selected Anatomical sites – HBCR



*Multimodality treatment: combines more than one treatment method (surgery, radiotherapy, systemic therapy)

**Systemic therapy: Comprised of chemotherapy, immunotherapy or targeted therapy

Cases only treated at the reporting institution

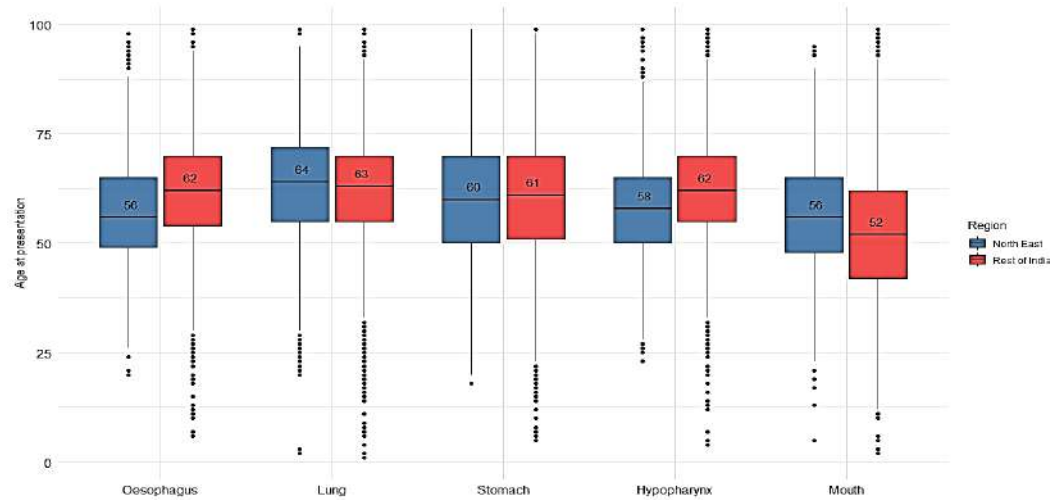
Over half of the breast cancer patients with localised and loco-regional disease extent have received multimodality treatment, whereas more than half of patients with distant metastatic disease received systemic therapy. Among cervical cancer patients, more than half of them have received a combination of radiotherapy and chemotherapy, irrespective of the disease stage. Multimodality treatment constitutes the treatment modality for about half of the head and neck cancer patients for all stages. In patients with lung and stomach cancer, systemic therapy is the primary treatment mode for localized and distant metastasis stages.



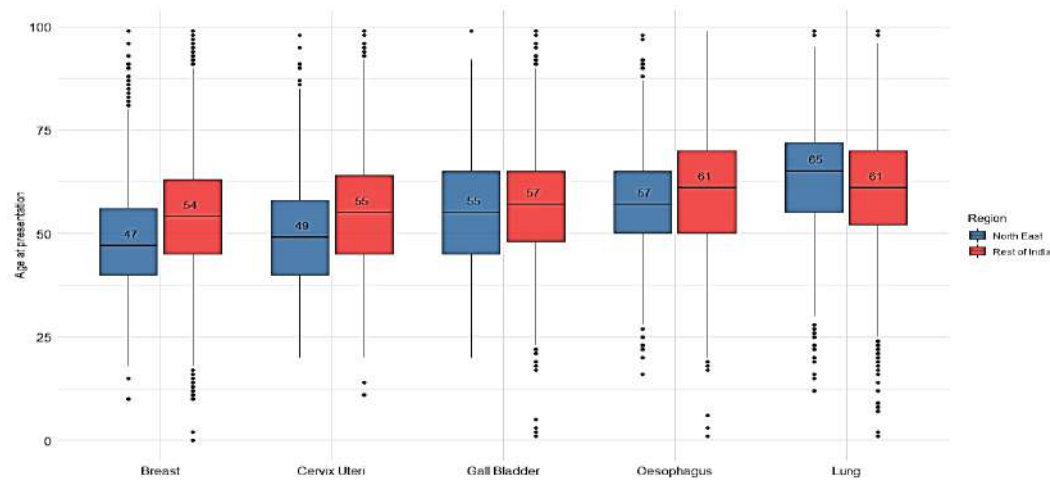


1.8 Median age at cancer diagnosis: North-East Region (NER) vs Rest of India

Males



Females



The median age at diagnosis in males is found to be less in NER compared to rest of India, for oesophageal cancer (56 years in NER; 62 years in rest of India) and cancer of hypopharynx (58 years in NER; 62 years in rest of India). In females, the median age at diagnosis was less in top four leading cancer sites except lung (Breast: 47 years in NER & 54 years in rest of India, cervix uteri: 49 years in NER & 56 years in rest of India, gall bladder: 56 years in NER & 57 years in rest of India, oesophagus: 57 years in NER & 61 years in rest of India).





1.9 Age-Specific Incidence Rate- All sites (0 to 75+) according to registry and gender

Males

	00-04	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+
Manipur state	5.1	4.2	3.7	5.7	5.3	8.1	17.4	23.0	38.3	54.0	109.6	165.1	230.2	381.9	490.9	466.1
Imphal West district	6.9	8.5	5.5	12.1	10.5	15.6	25.2	46.1	47.2	75.4	140.6	226.4	317.6	593.7	798.9	787.6
Mizoram state	9.2	5.8	7.8	6.9	9.6	13.8	28.5	63.2	153.8	260.7	474.2	668.6	794.2	1106.9	1289.3	1527.7
Aizawl district	15.9	8.4	15.5	10.3	11.9	19.2	37.5	87.7	198.5	345.3	664.9	893.0	1091.3	1396.6	1466.4	1894.5
Sikkim state	4.0	6.6	1.2	5.2	8.1	9.4	18.7	26.1	46.2	90.0	135.5	234.9	371.5	473.3	666.6	808.0
Tripura state	6.1	3.7	3.5	5.8	5.1	7.7	17.9	23.3	50.4	97.0	167.1	272.2	393.7	432.8	489.1	446.2
West Arunachal	5.5	2.0	5.0	5.8	13.5	19.5	26.2	47.0	76.3	160.5	263.0	322.5	472.2	500.9	581.8	322.4
Papumpare district	10.5	1.9	11.3	8.0	24.0	43.2	60.0	94.5	105.8	263.3	520.2	523.4	1019.3	1022.6	1368.2	773.2
Meghalaya	2.0	2.7	3.3	4.8	6.8	13.2	33.2	99.5	205.4	376.8	523.8	600.7	713.6	720.5	843.5	691.4
East Khasi Hills district	3.3	2.3	2.7	3.7	6.8	13.5	46.5	130.9	259.3	483.8	688.9	737.0	923.5	953.3	1177.2	840.4
Nagaland	2.5	4.6	2.8	9.1	9.5	22.1	34.8	49.4	98.9	183.7	311.6	411.3	435.5	654.2	773.4	677.3
Pasighat	10.9	5.7	2.2	9.8	24.1	13.7	52.7	50.1	72.4	215.3	255.3	318.2	465.3	610.4	761.6	668.0
Cachar district	7.0	6.1	5.7	6.1	9.6	19.1	30.1	56.2	93.4	186.2	284.6	417.2	531.9	679.6	785.1	698.5
Dibrugarh district	3.9	3.8	4.6	4.3	8.7	10.1	16.8	45.4	50.3	131.8	193.6	243.8	381.0	541.4	594.1	565.7
Kamrup urban	7.2	7.4	10.0	11.9	15.5	24.3	34.5	74.5	132.4	238.9	396.9	686.9	780.8	1220.3	1477.0	1633.5

Females

	00-04	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+
Manipur state	5.1	3.3	3.8	6.0	12.1	16.1	37.1	54.2	78.4	104.1	153.8	189.5	267.3	342.8	404.6	313.6
Imphal West district	11.8	9.7	4.9	15.2	29.1	28.5	61.0	83.0	131.9	173.2	220.4	254.4	423.5	501.0	574.6	524.8
Mizoram state	6.6	5.6	6.8	7.8	15.2	26.7	57.3	129.0	218.8	228.0	396.8	460.3	607.2	841.0	1026.9	997.1
Aizawl district	12.2	3.2	12.6	6.7	18.4	29.3	61.8	148.9	275.3	278.3	494.3	564.6	689.7	1022.6	1298.1	1470.3
Sikkim state	8.5	3.8	5.0	5.3	11.6	23.9	41.6	67.0	94.2	168.4	220.0	250.0	338.3	418.4	558.4	565.5
Tripura state	3.7	2.6	3.2	4.5	6.4	14.8	28.6	49.6	70.3	122.1	150.4	201.4	233.9	211.6	225.3	156.9
West Arunachal	5.2	1.2	3.5	4.9	17.1	26.8	41.6	79.9	117.7	185.7	299.4	301.6	420.6	276.3	368.2	312.5
Papumpare district	4.4	1.9	3.0	5.8	40.0	37.3	92.0	168.3	218.0	353.1	675.0	749.9	1164.7	661.8	977.9	623.4
Meghalaya	1.4	1.2	1.1	2.7	6.2	14.5	27.8	53.5	112.8	170.5	268.3	318.1	400.1	400.9	478.6	429.5
East Khasi Hills district	1.1	2.0	0.4	2.9	6.7	12.8	30.9	58.2	127.9	186.3	336.3	379.9	520.5	541.5	593.4	564.2
Nagaland	3.1	2.1	1.5	4.4	9.7	23.3	47.0	95.6	130.7	182.4	251.7	256.3	316.4	351.5	337.0	215.9
Pasighat	0.0	3.0	2.2	4.9	22.7	28.6	85.8	108.9	193.9	252.4	373.3	364.3	353.7	405.2	383.0	274.9
Cachar district	2.6	2.8	3.6	3.9	17.1	34.8	62.2	138.4	178.9	237.3	289.5	309.8	311.5	362.6	324.2	282.8
Dibrugarh district	2.6	2.0	1.2	2.7	11.2	18.0	40.2	69.5	107.6	177.0	217.0	248.3	272.3	297.3	296.1	172.4
Kamrup urban	6.6	7.5	5.3	15.2	16.2	41.9	57.4	108.2	160.6	282.9	416.5	532.3	605.9	796.7	943.5	796.7

The age-specific incidence rate in males is highest in the age group of 70 to 74 years in most places except for Mizoram, Aizawl district, Sikkim, and Kamrup urban, where the rate is highest in the 75+ age group. In females, the highest incidence is observed in 60-64 years in West Arunachal, Papumpare district and Tripura, while Sikkim and Aizawl district report the highest incidence rates





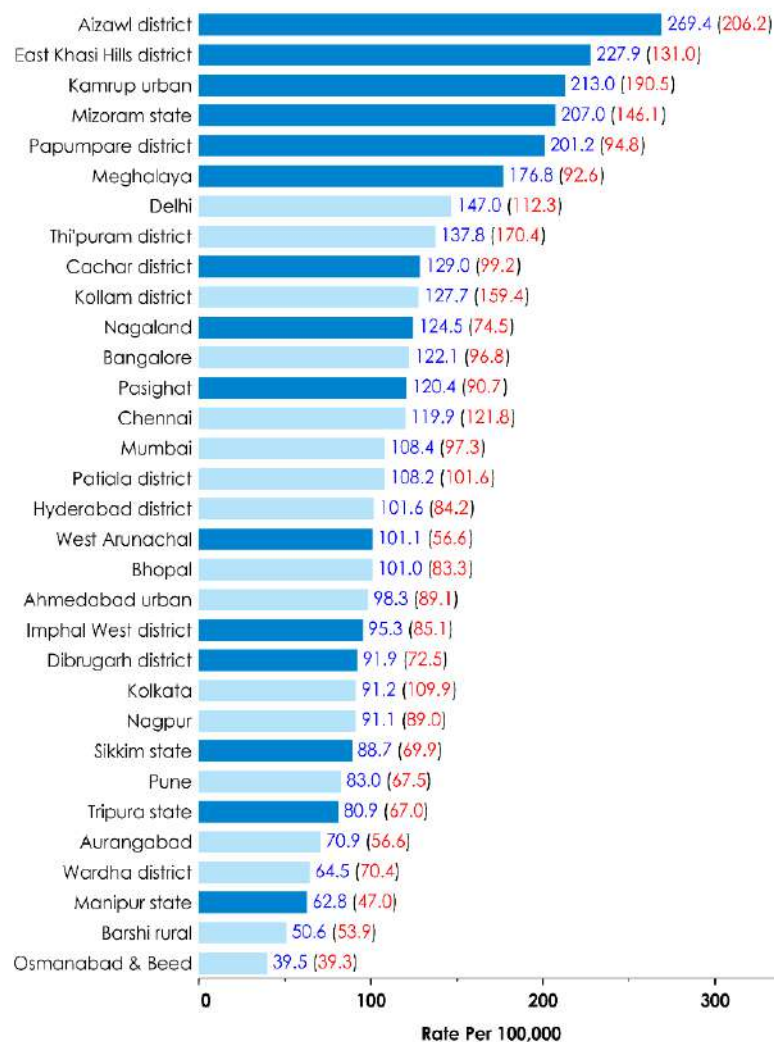
in the 75+ year age group. Nagaland, Pasighat, Cachar and Dibrugarh record the highest incidence in 65-69 years age group. In the remaining places, the highest age-specific incidence rate is observed in the 70-74-year age group. With regard to gender difference in the age-specific incidence rates, the ASpR was significantly higher in males in the age groups of 50-74 years in Mizoram, Tripura, West Arunachal, Nagaland, Cachar, Dibrugarh and Kamrup. The ASpR was also significantly higher in males in the age groups of 75 plus years in Mizoram, Sikkim, Tripura, West Arunachal, Nagaland, Pasighat, Cachar, Dibrugarh and Kamrup. In Meghalaya, the ASpR was high in males in all the age groups. In Manipur, the ASpR was significantly less in males in the 25-49- and 50-74-years age group.

1.10 Comparison of Age adjusted Incidence rates (AAR) for all cancers across North-East India

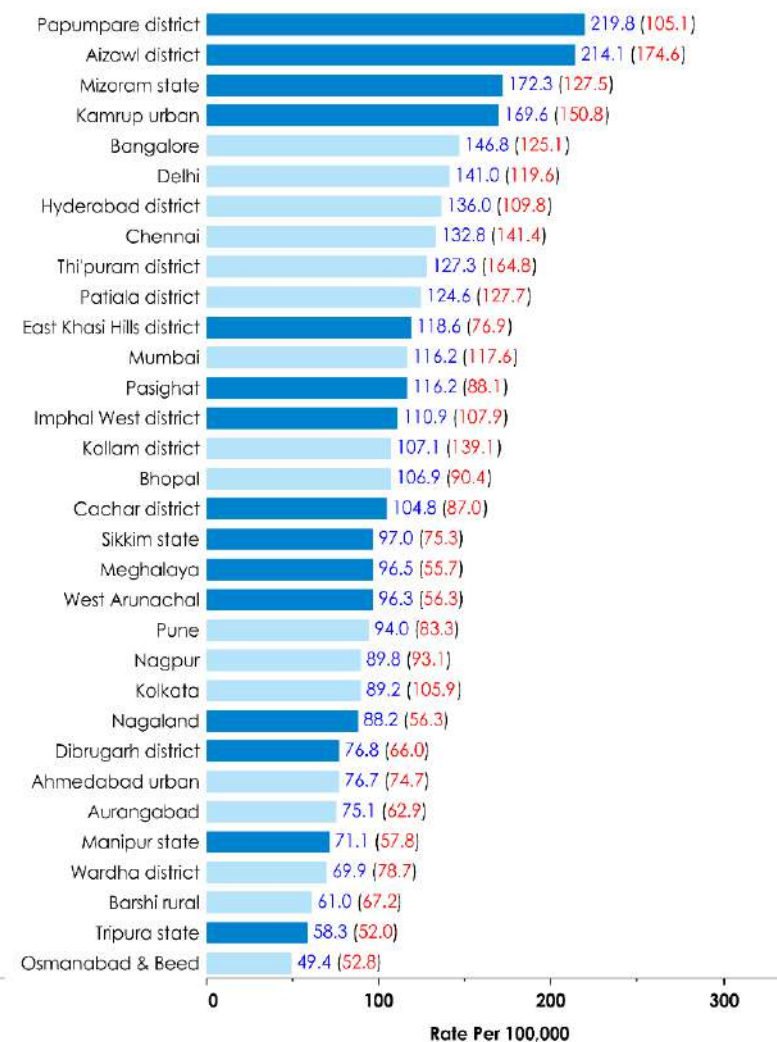
The age adjusted incidence rate for all cancer sites is the highest among males in Aizawl district (269.4 per 100,000 population) and females in Papumpare district in Arunachal Pradesh (219.8 per 100,000 population). East Khasi hills district in Meghalaya reports the highest AAR for cancer of the tongue (males), mouth (females), oropharynx (males), hypopharynx (males), oesophagus (males and females) and larynx (males and females). In Kamrup urban, the highest AAR has been observed for cancer of the oropharynx (females), hypopharynx (females) and gall bladder (both genders). The AAR for cancer of the nasopharynx is seen to be the most in both genders in Nagaland. Papumpare district also records the steepest AAR rates for cancer of the stomach (males), liver (both genders), cervix uteri, ovary and thyroid. The AAR for stomach (males), colon, colorectal and lung cancer in both genders is at a maximal value in Aizawl district. In females, the AAR is the most for Non-Hodgkins Lymphoma in Imphal West district and brain cancer in Sikkim state.



All Sites - Males



All Sites - Females

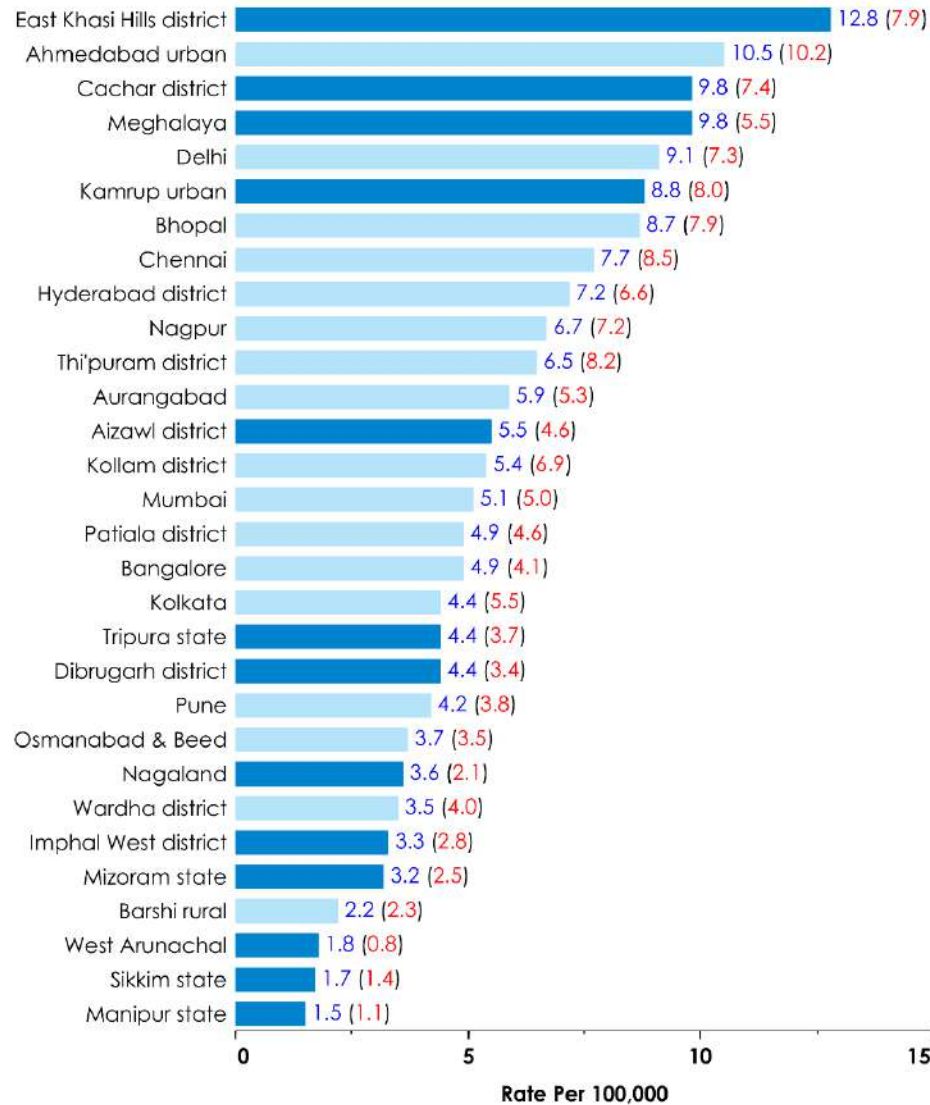


AAR (CR) ■ North-East India ■ Rest of India

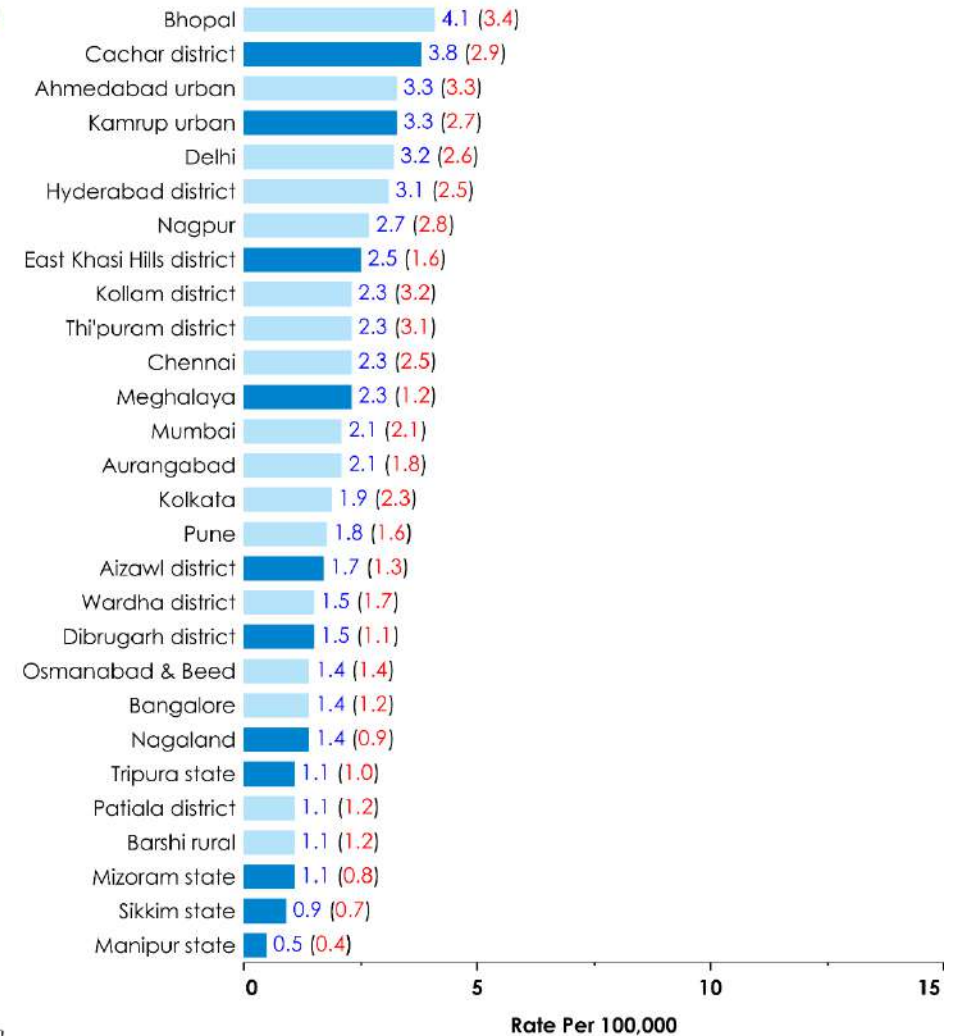




Tongue - Males



Tongue - Females

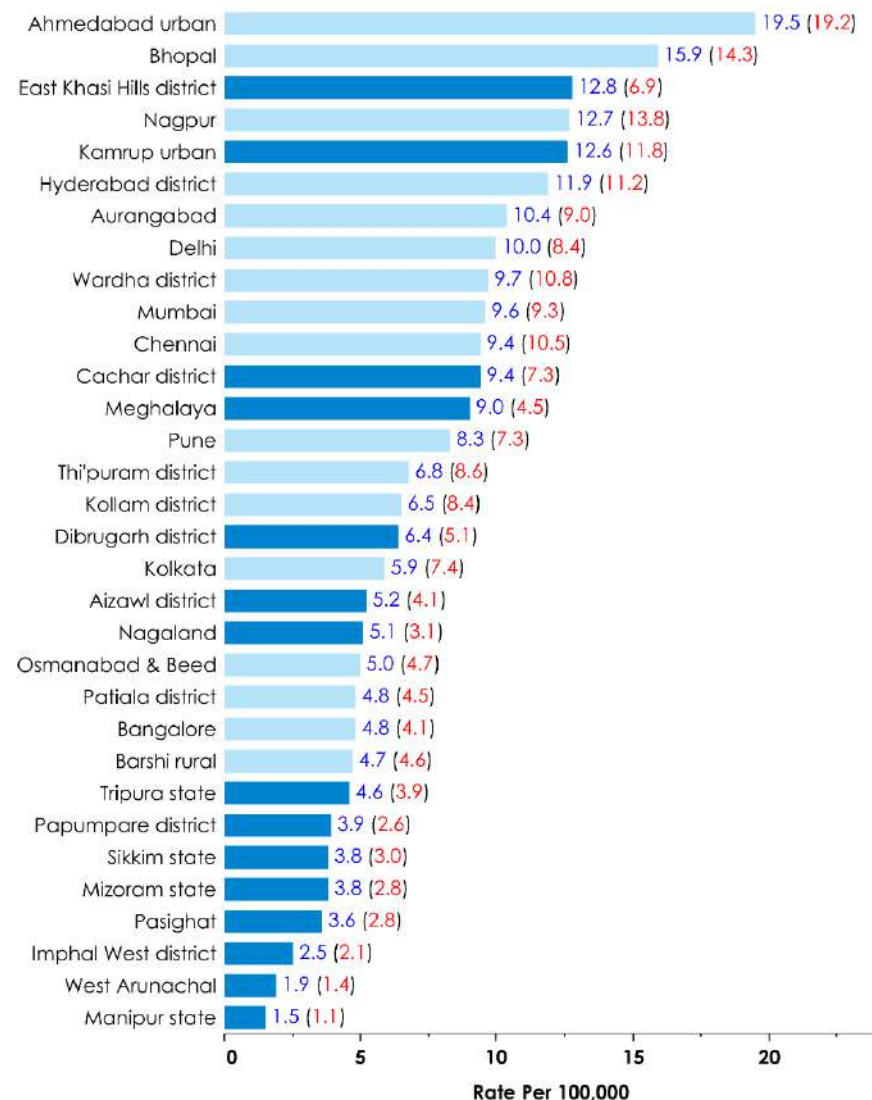


AAR (CR) ■ North-East India ■ Rest of India

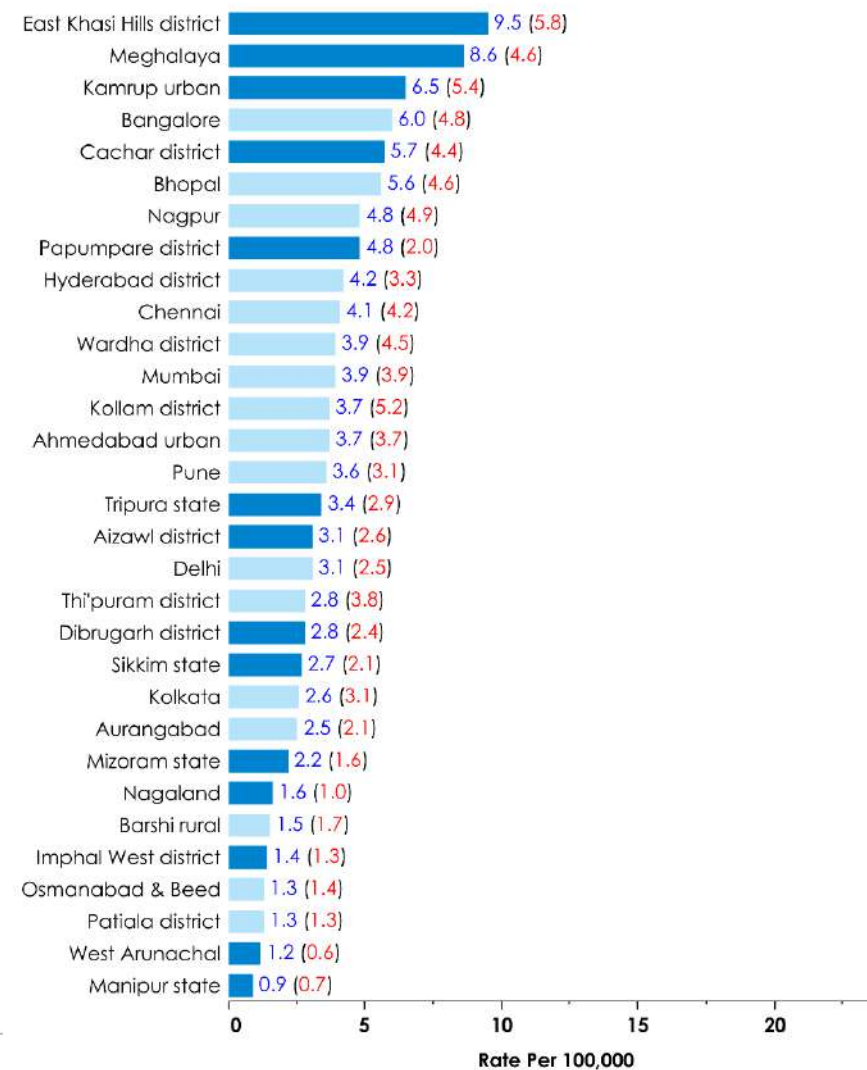




Mouth - Males



Mouth - Females

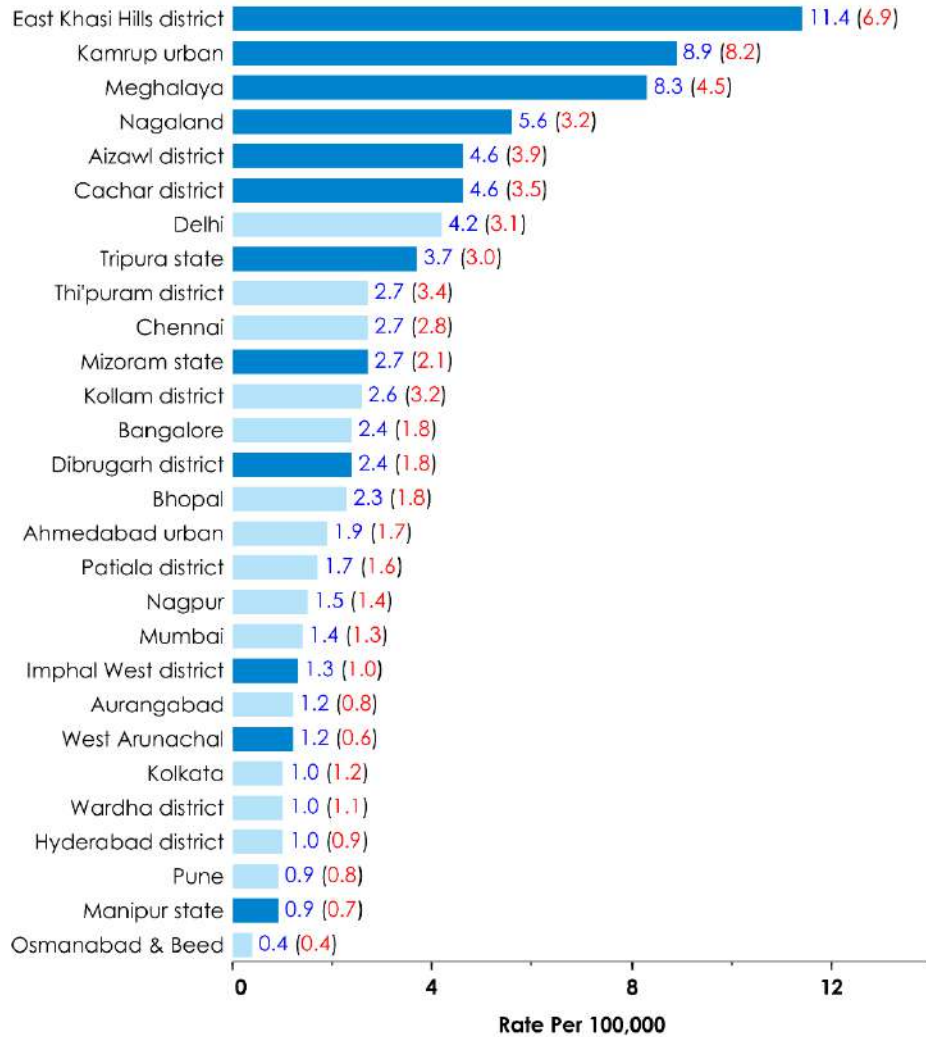


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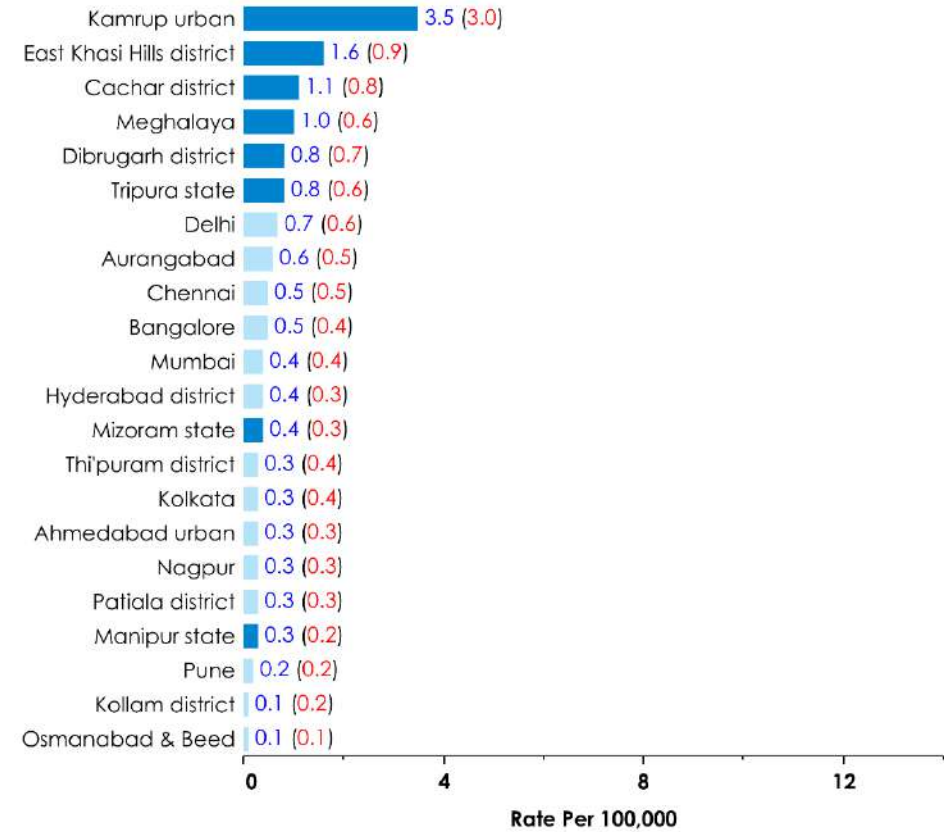




Oropharynx - Males



Oropharynx - Females

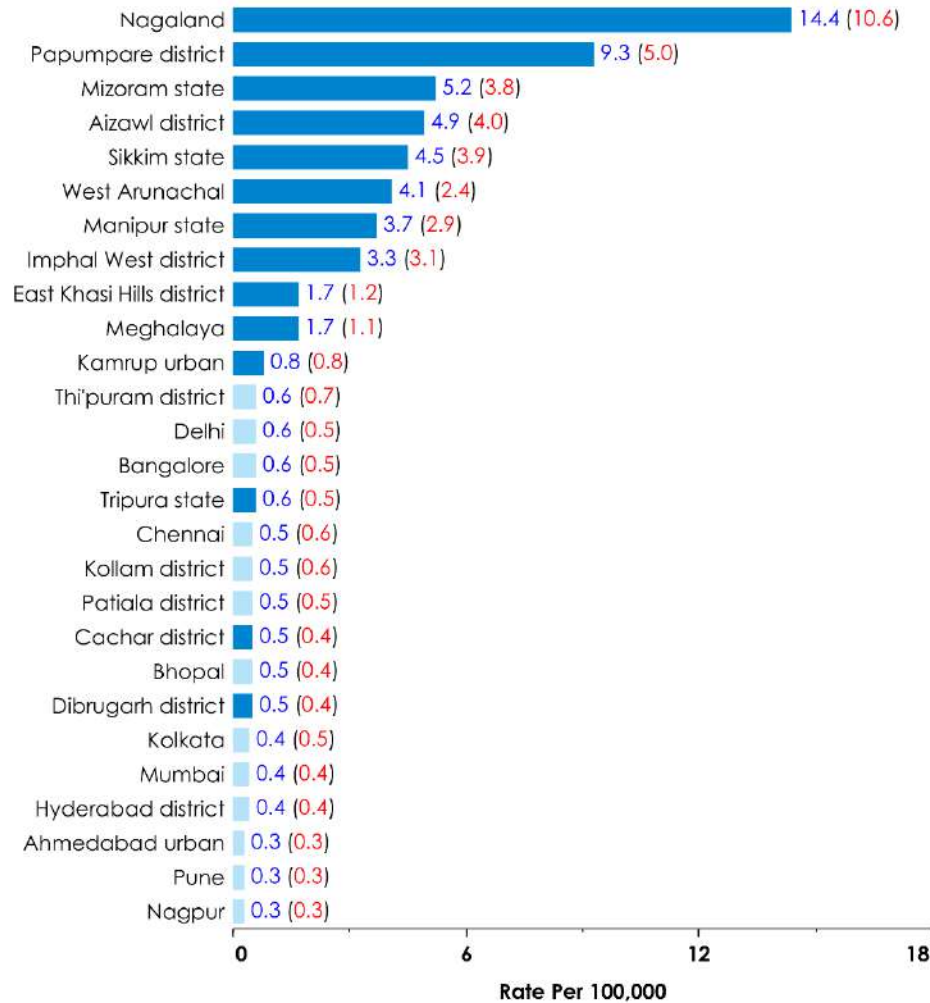


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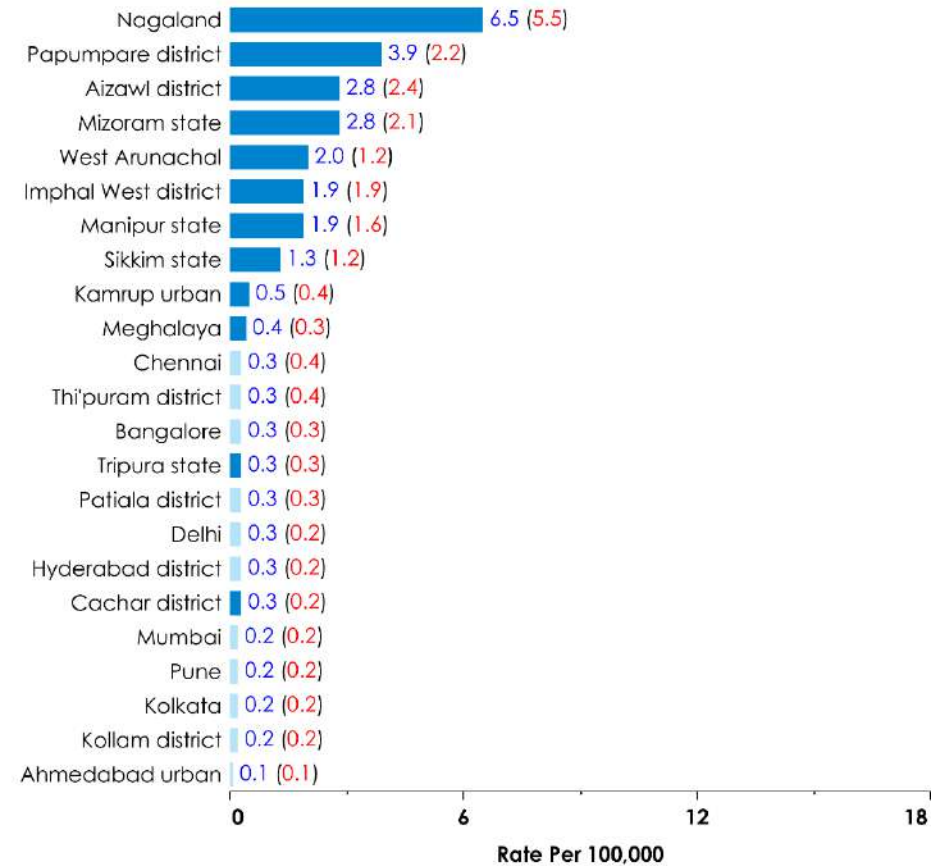




Nasopharynx - Males



Nasopharynx - Females

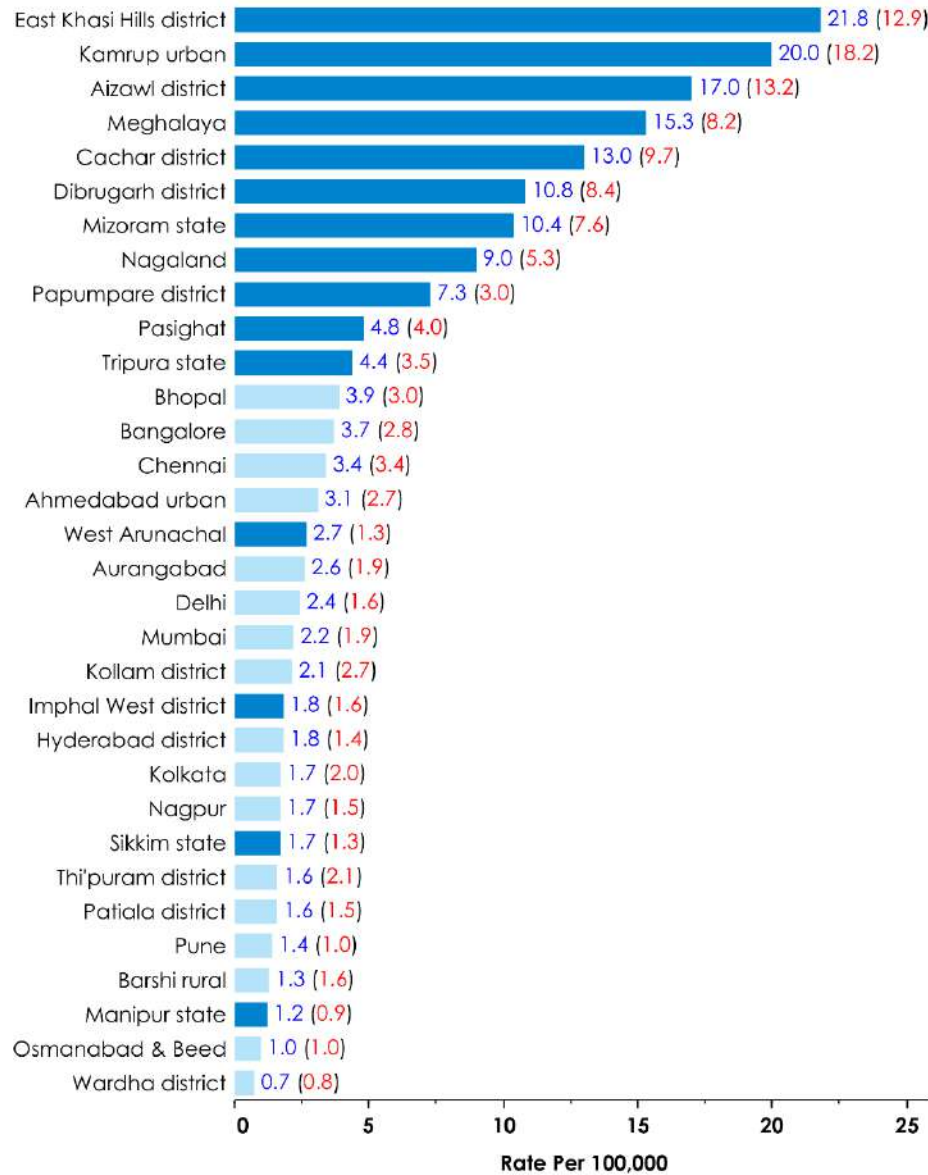


AAR (CR) ■ North-East India ■ Rest of India

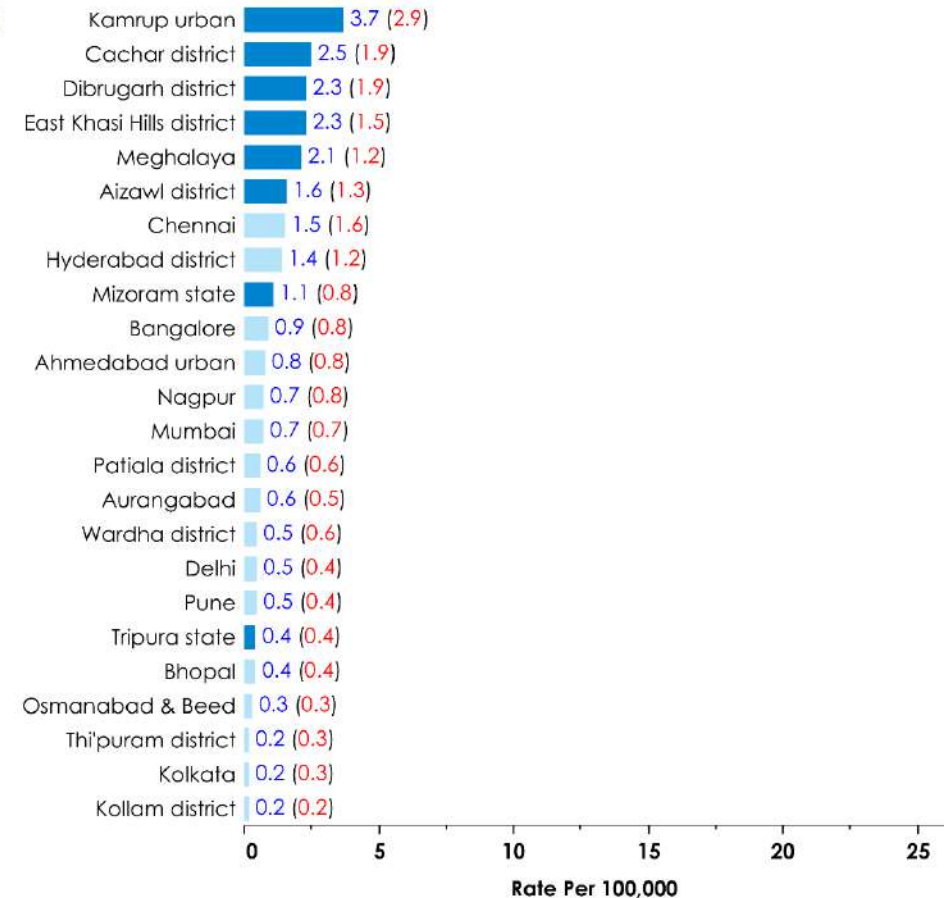




Hypopharynx - Males



Hypopharynx - Females

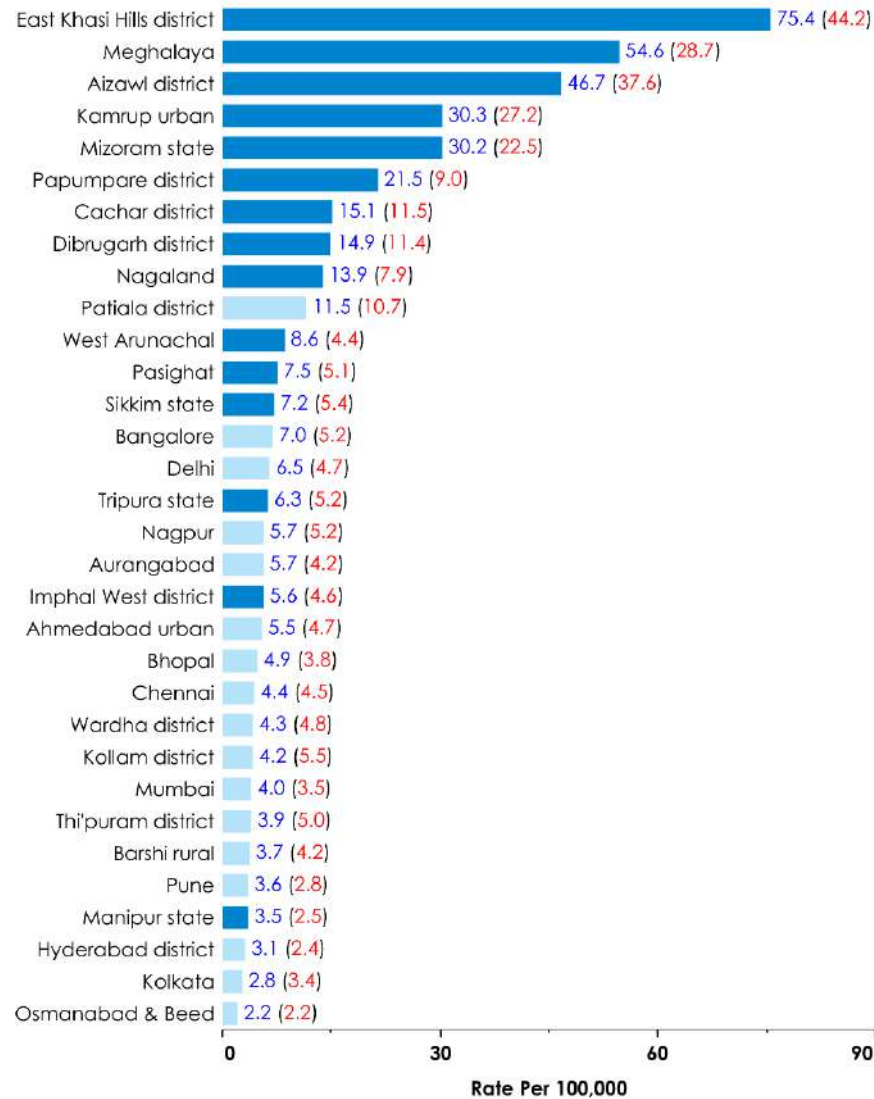


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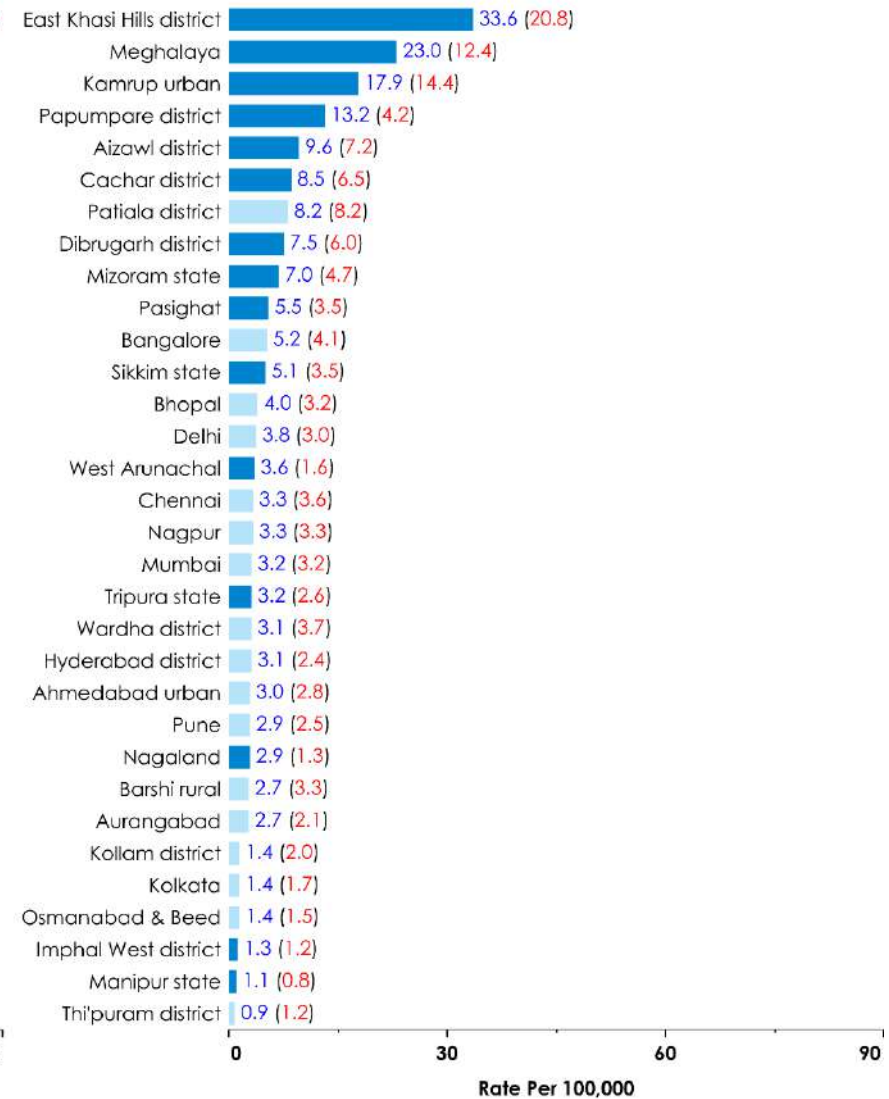




Oesophagus - Males



Oesophagus - Females

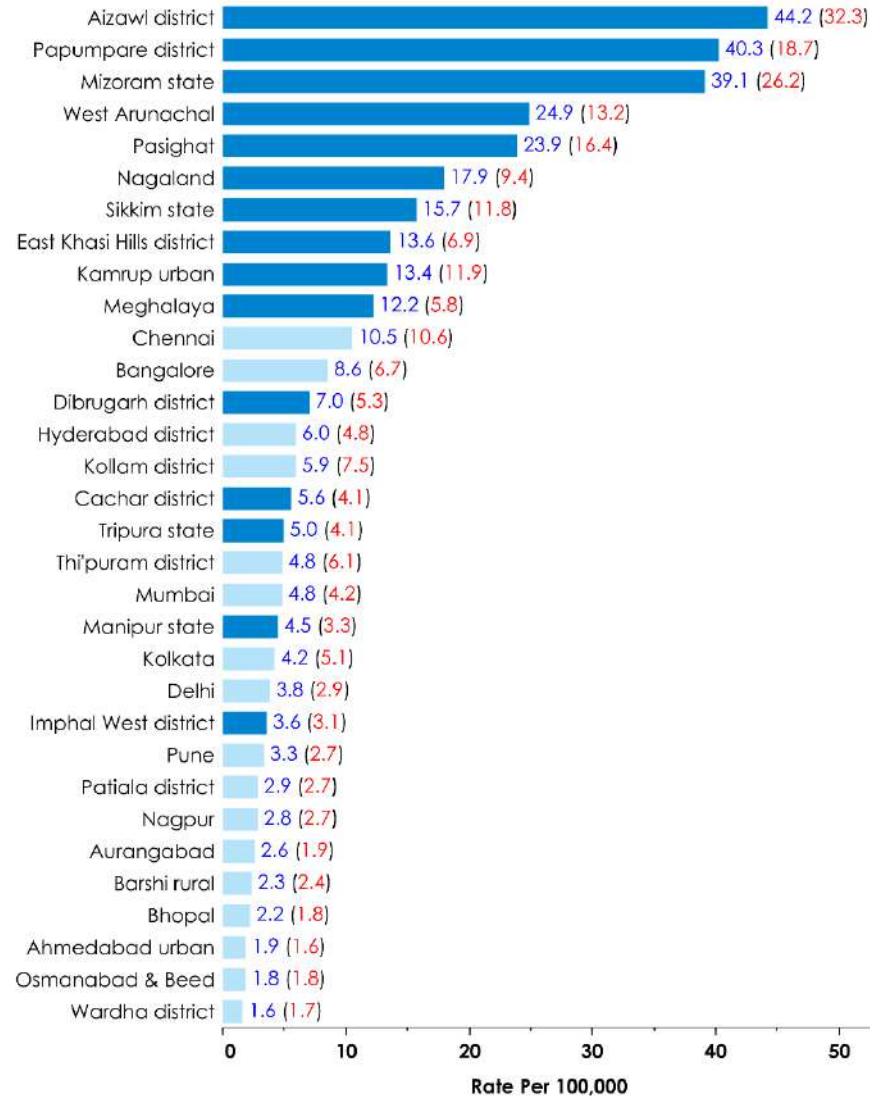


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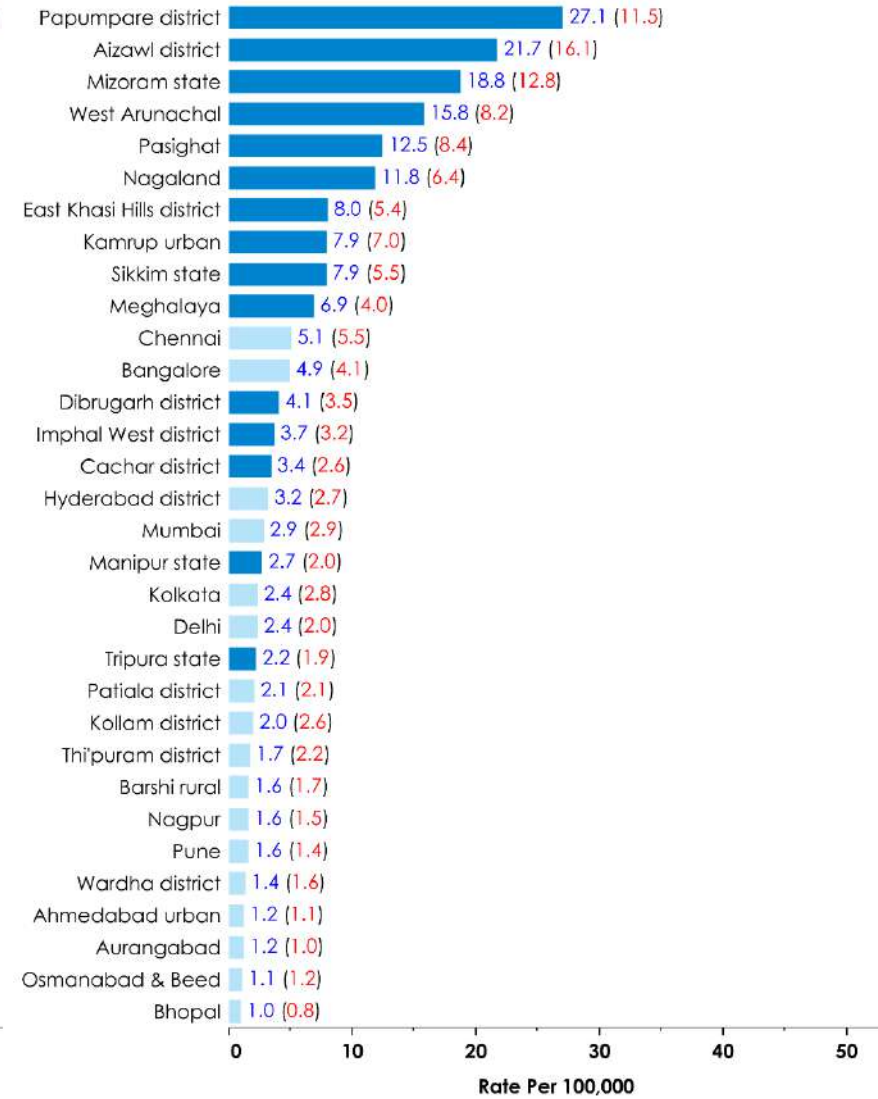




Stomach - Males



Stomach - Females

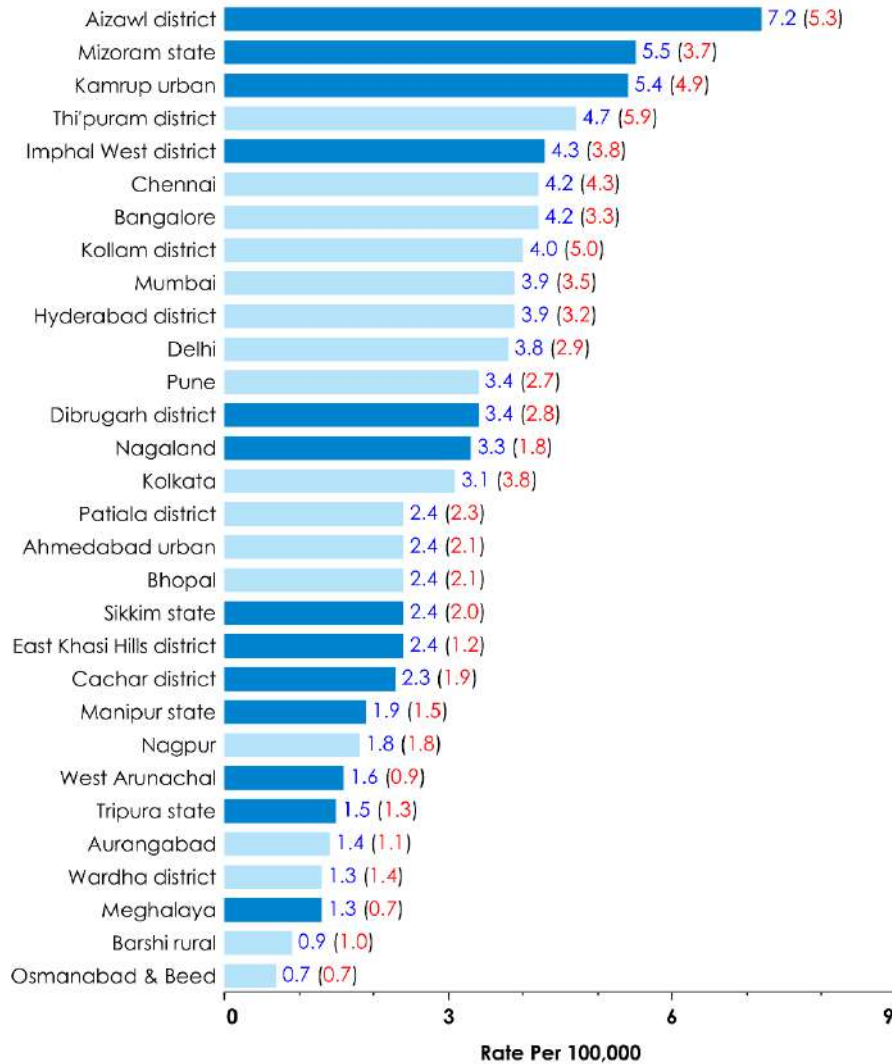


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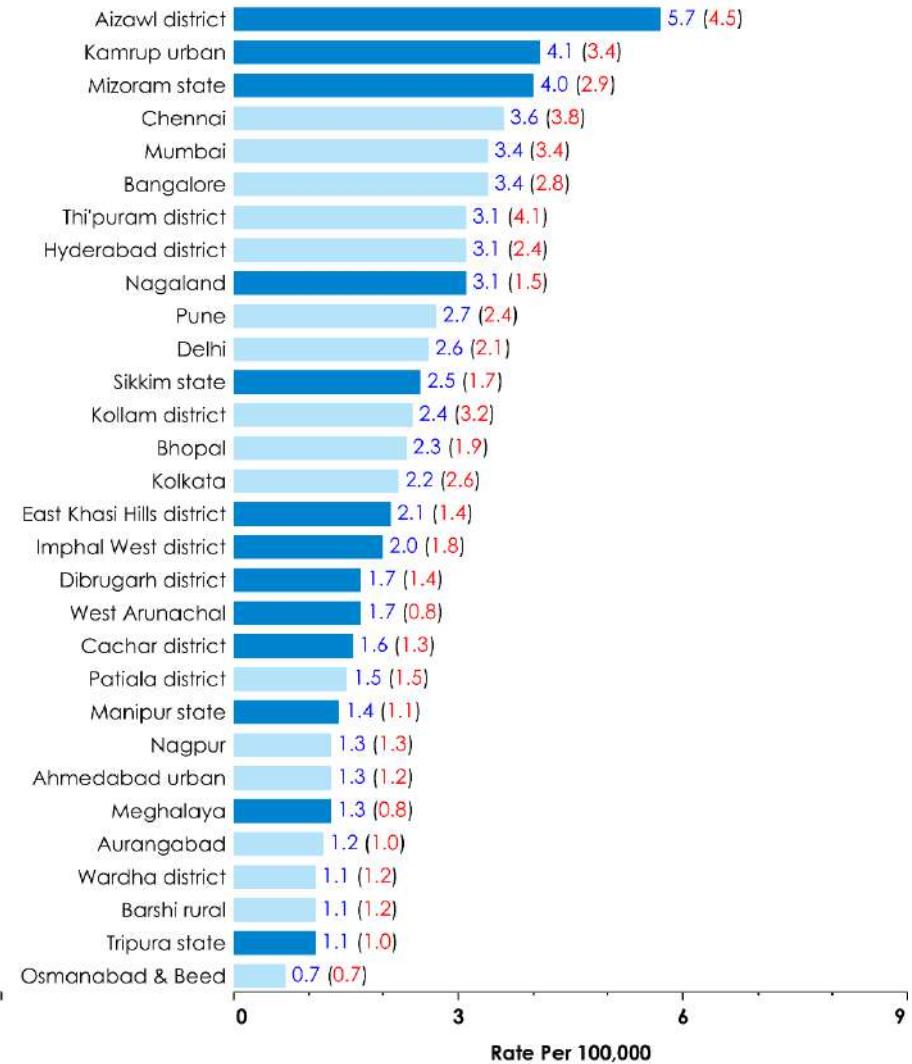




Colon - Males



Colon - Females

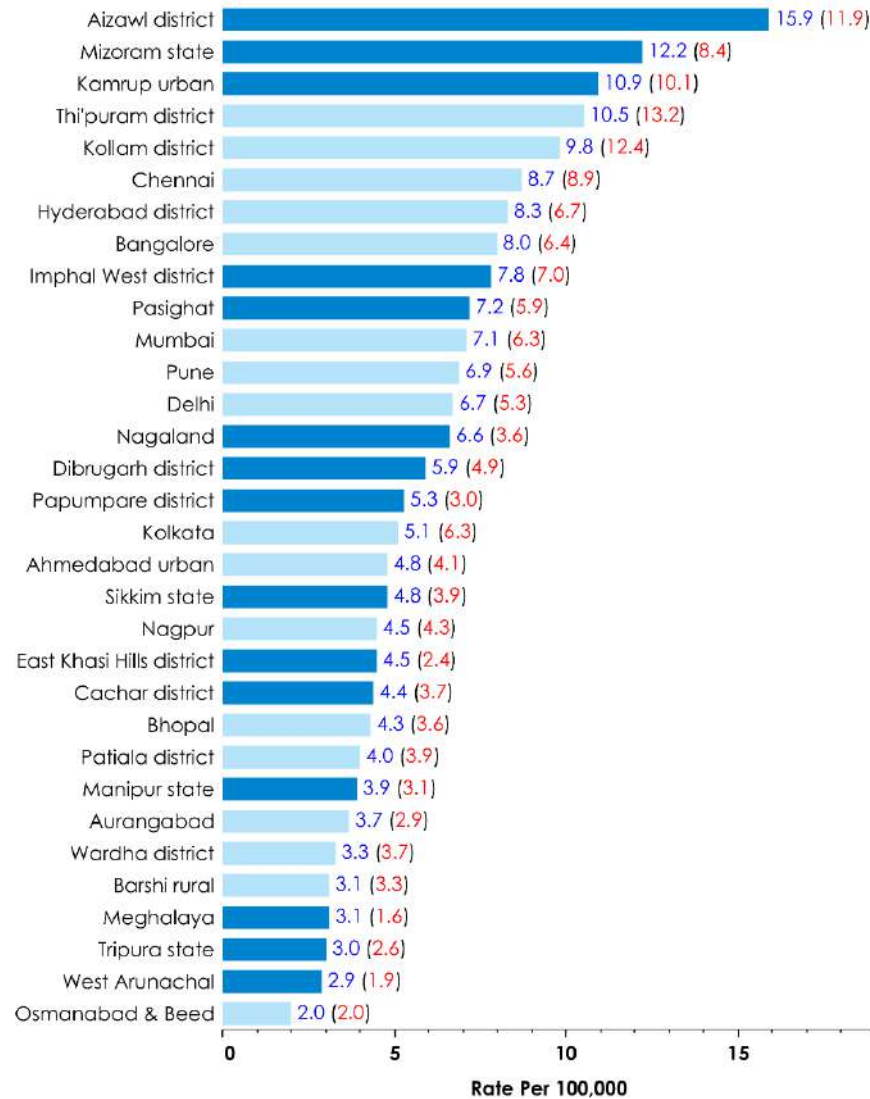


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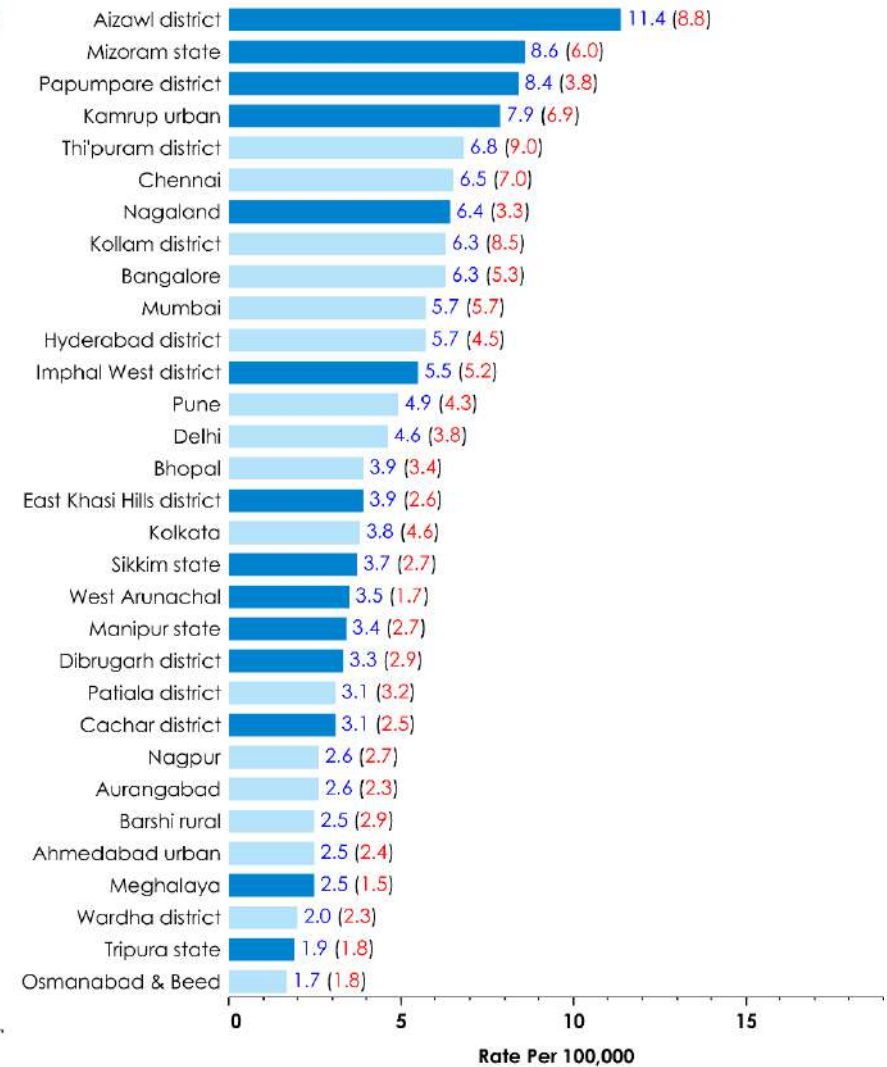




Colorectal - Males



Colorectal - Females

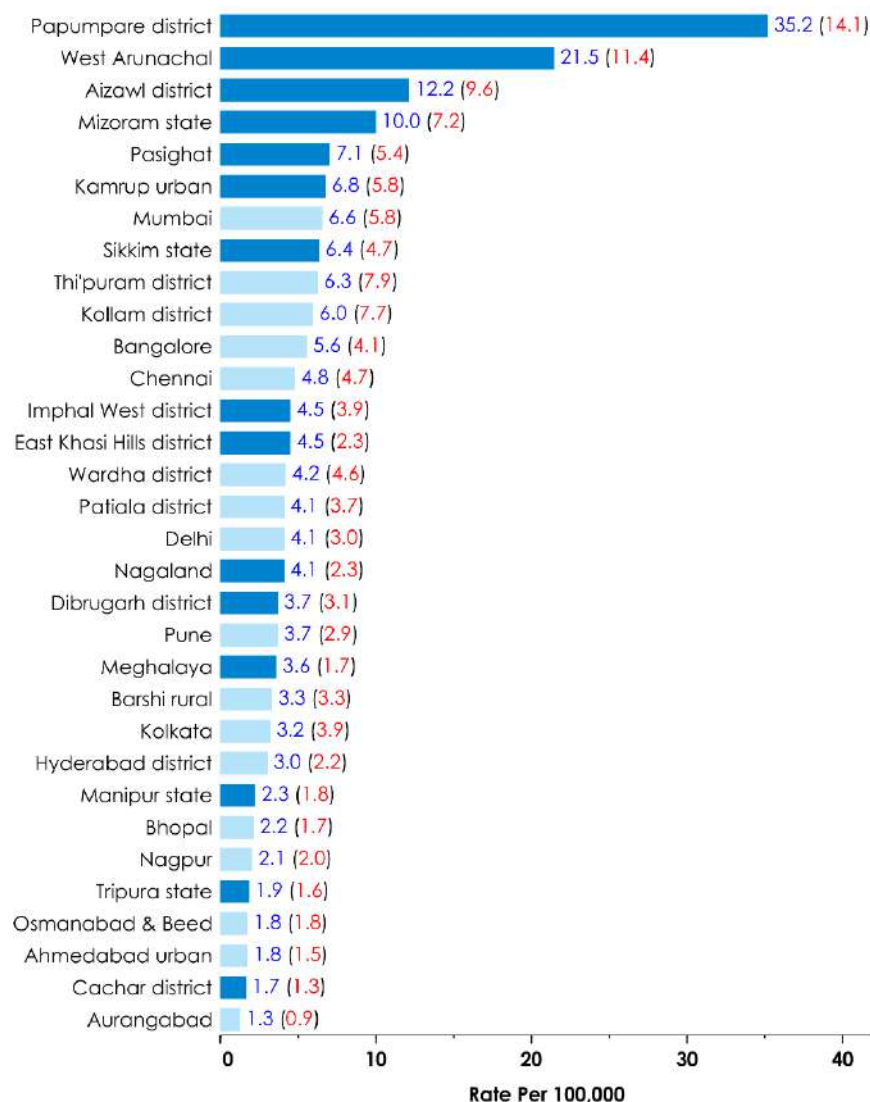


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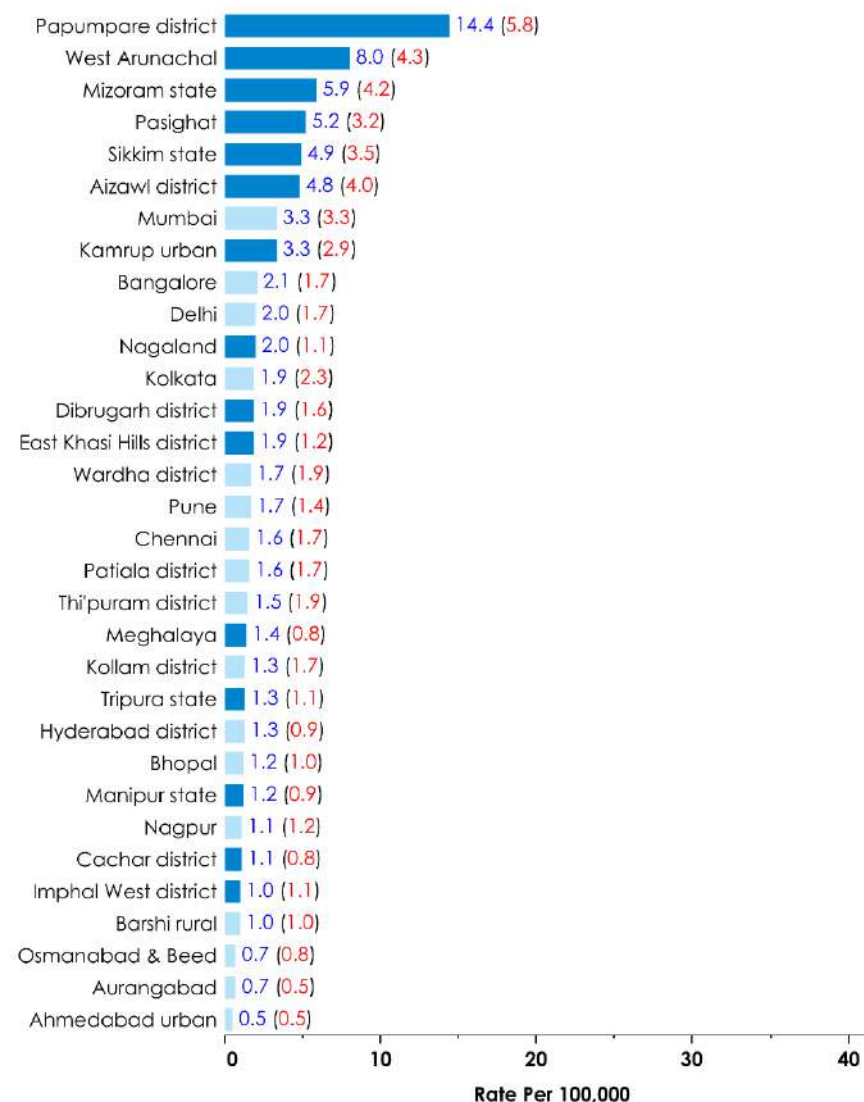




Liver - Males



Liver - Females

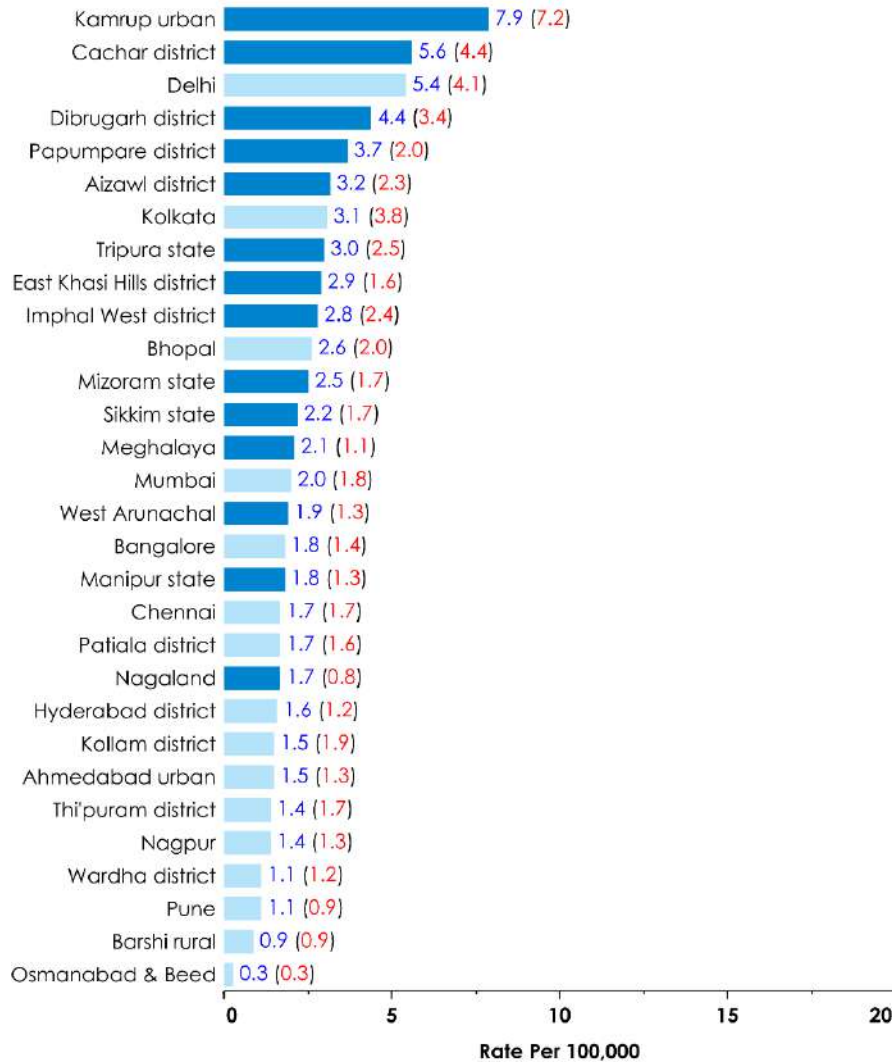


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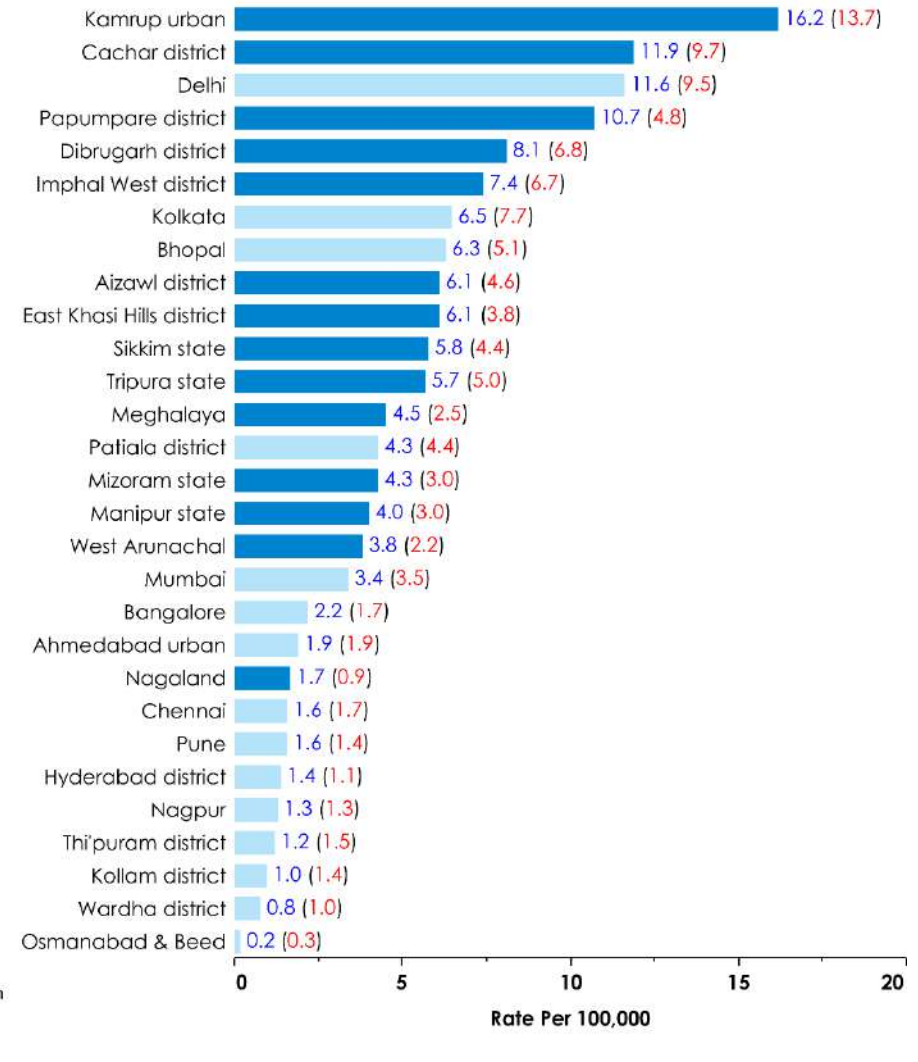




Gall Bladder - Males



Gall Bladder - Females

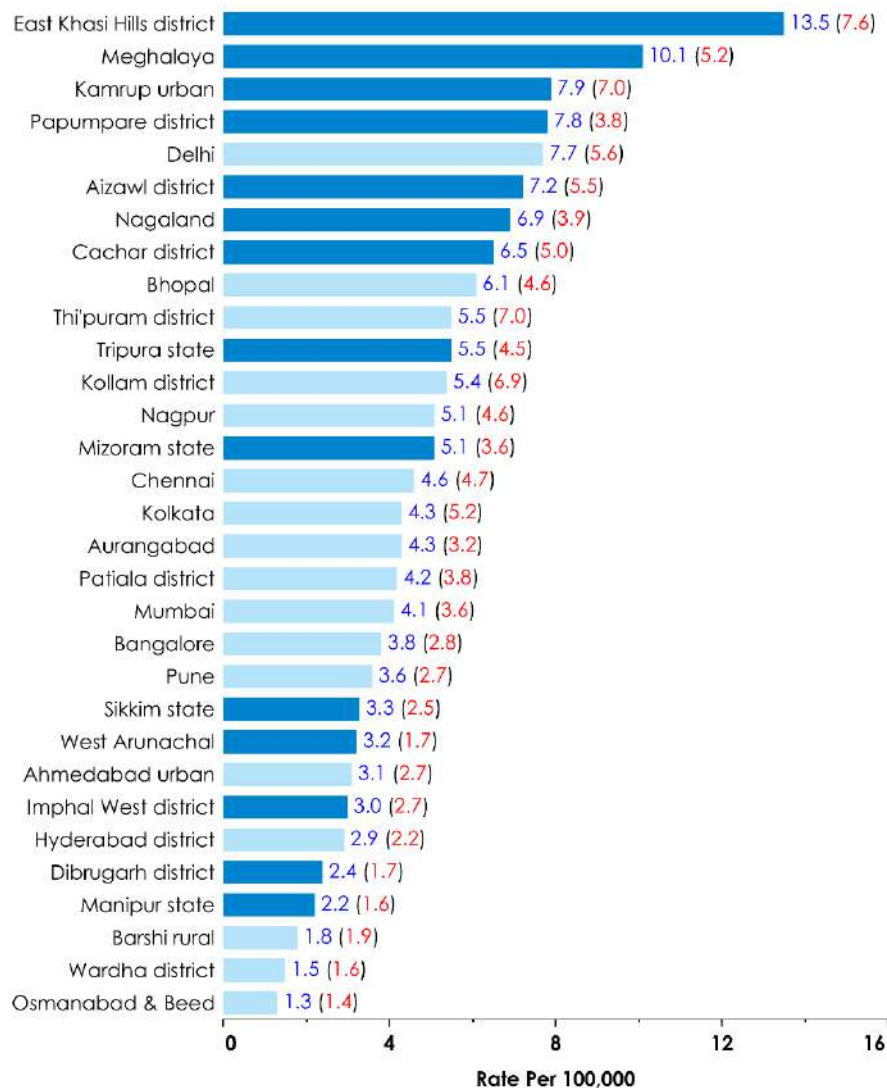


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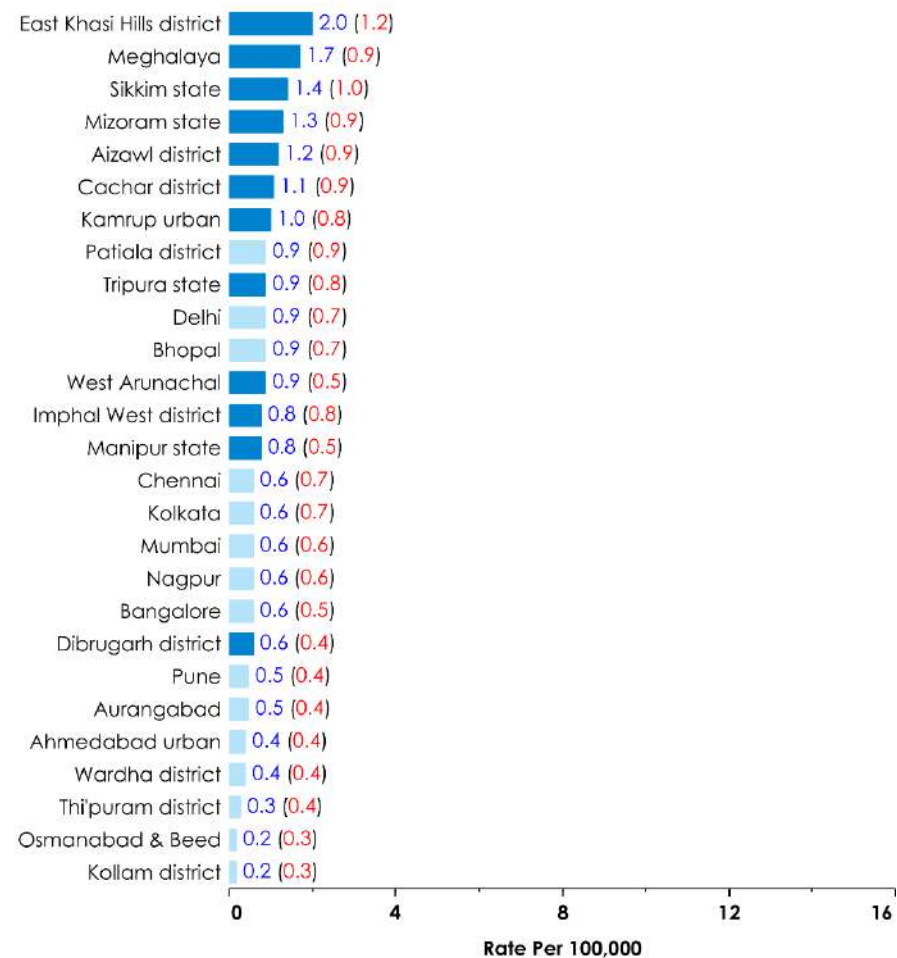




Larynx - Males



Larynx - Females

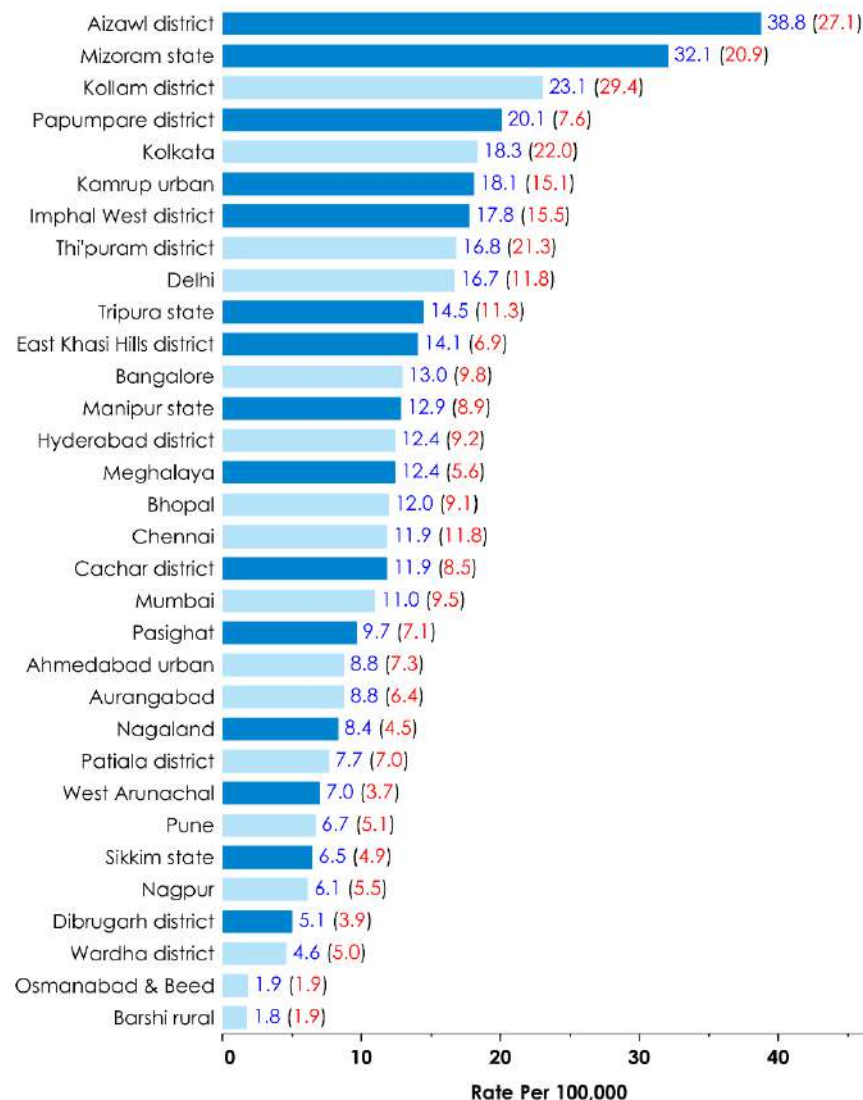


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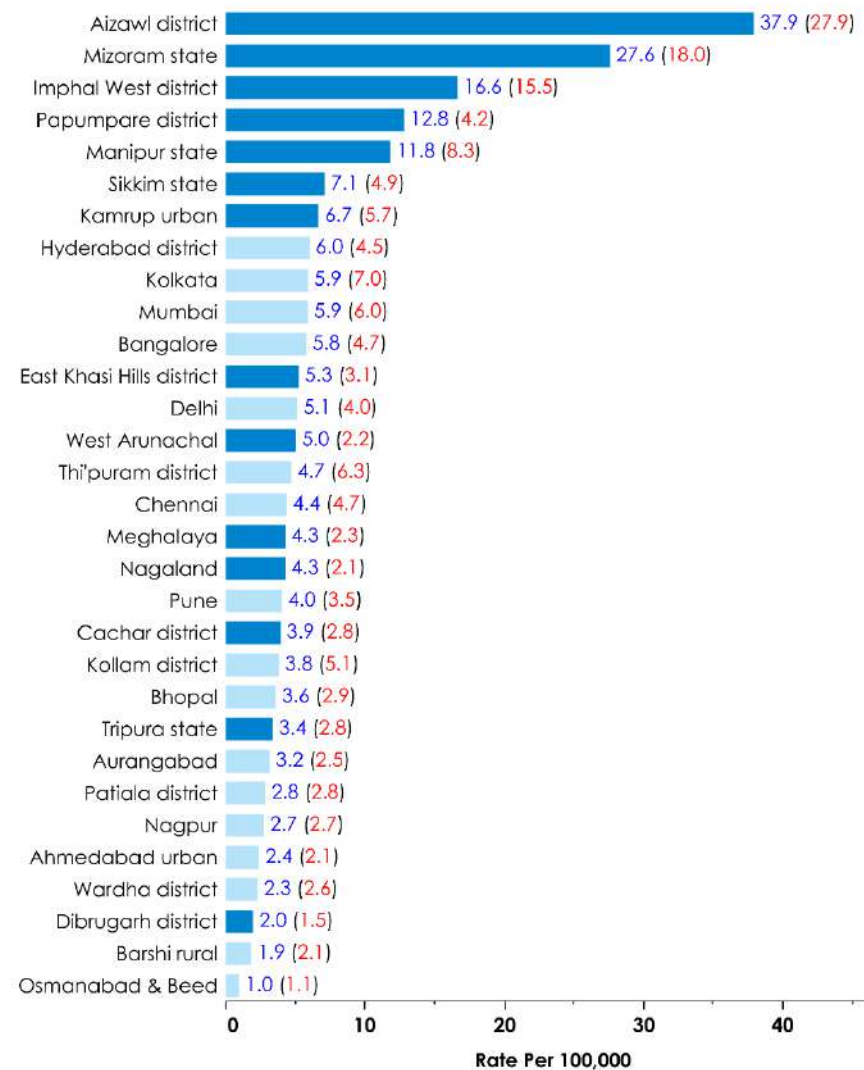




Lung - Males



Lung - Females

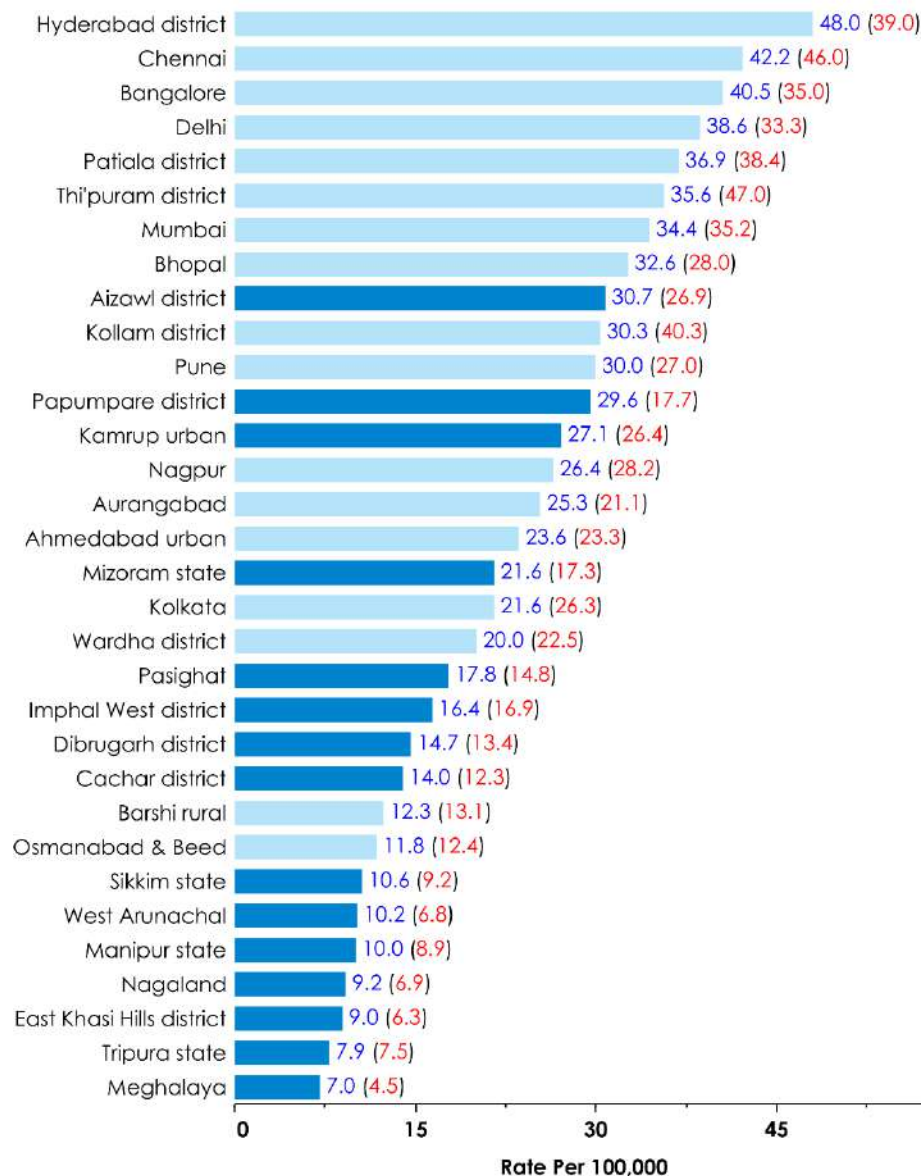


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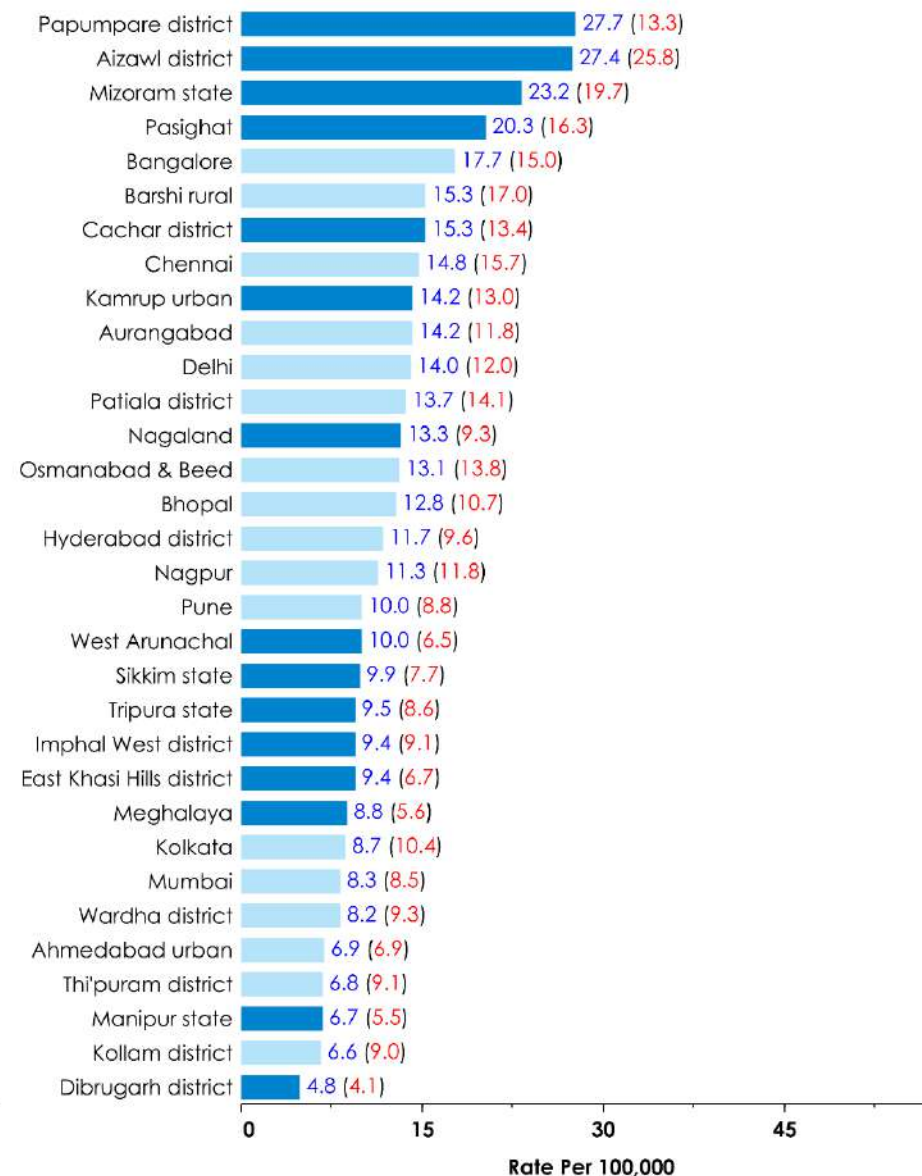




Breast - Females



Cervix Uteri

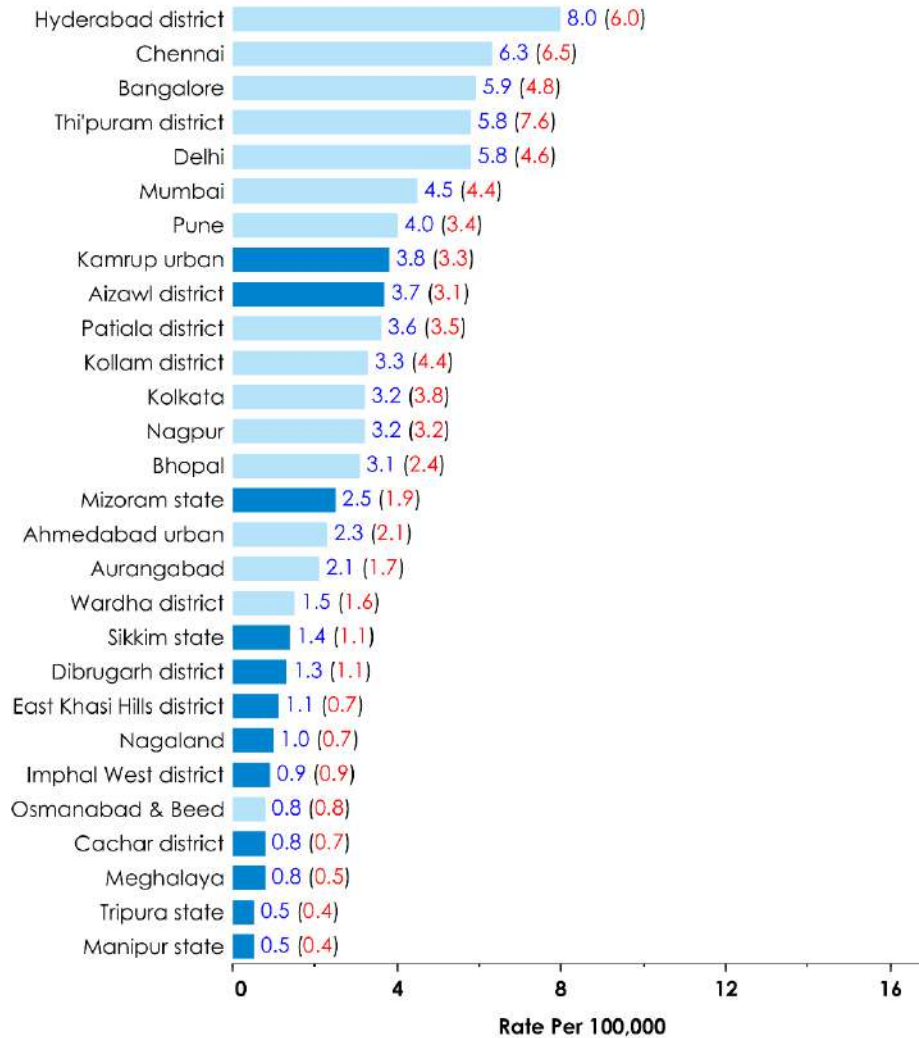


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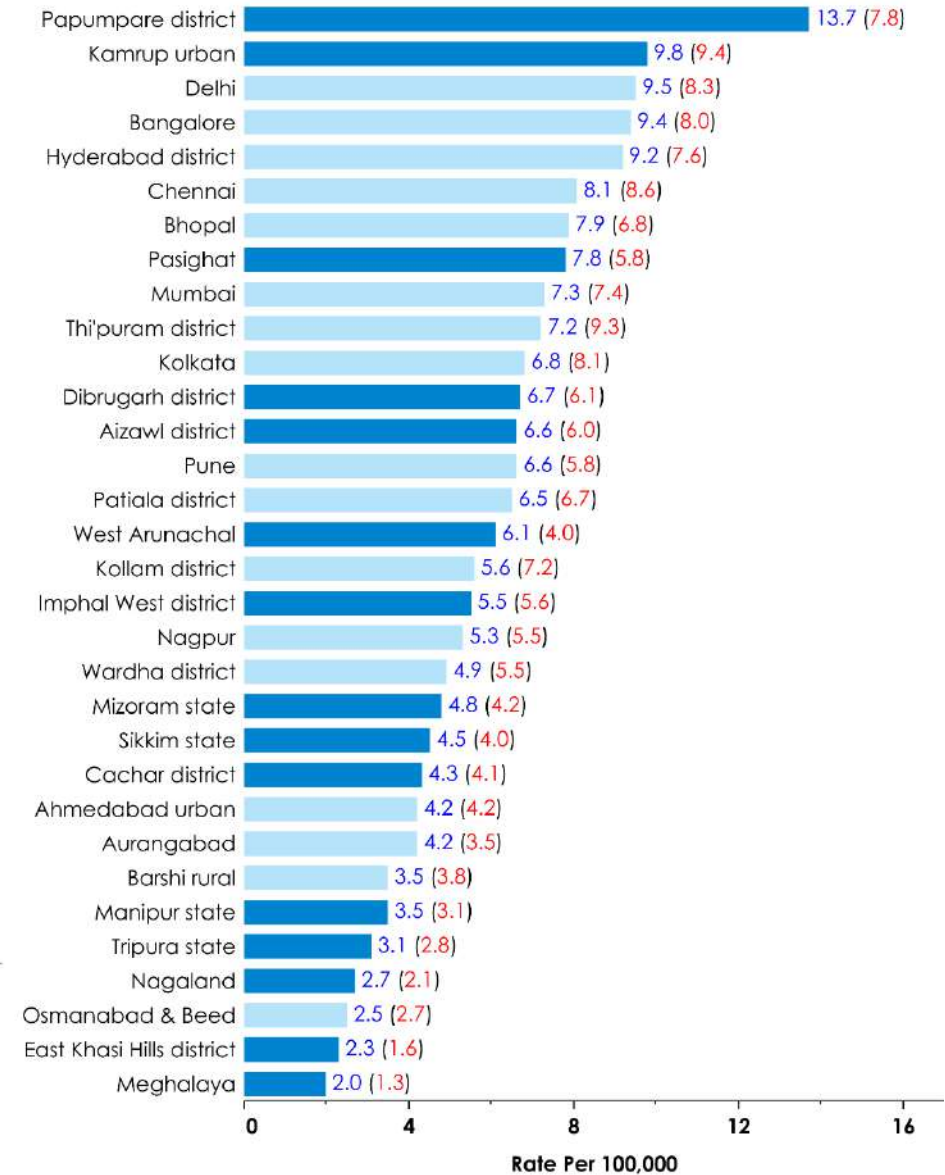




Corpus Uteri



Ovary

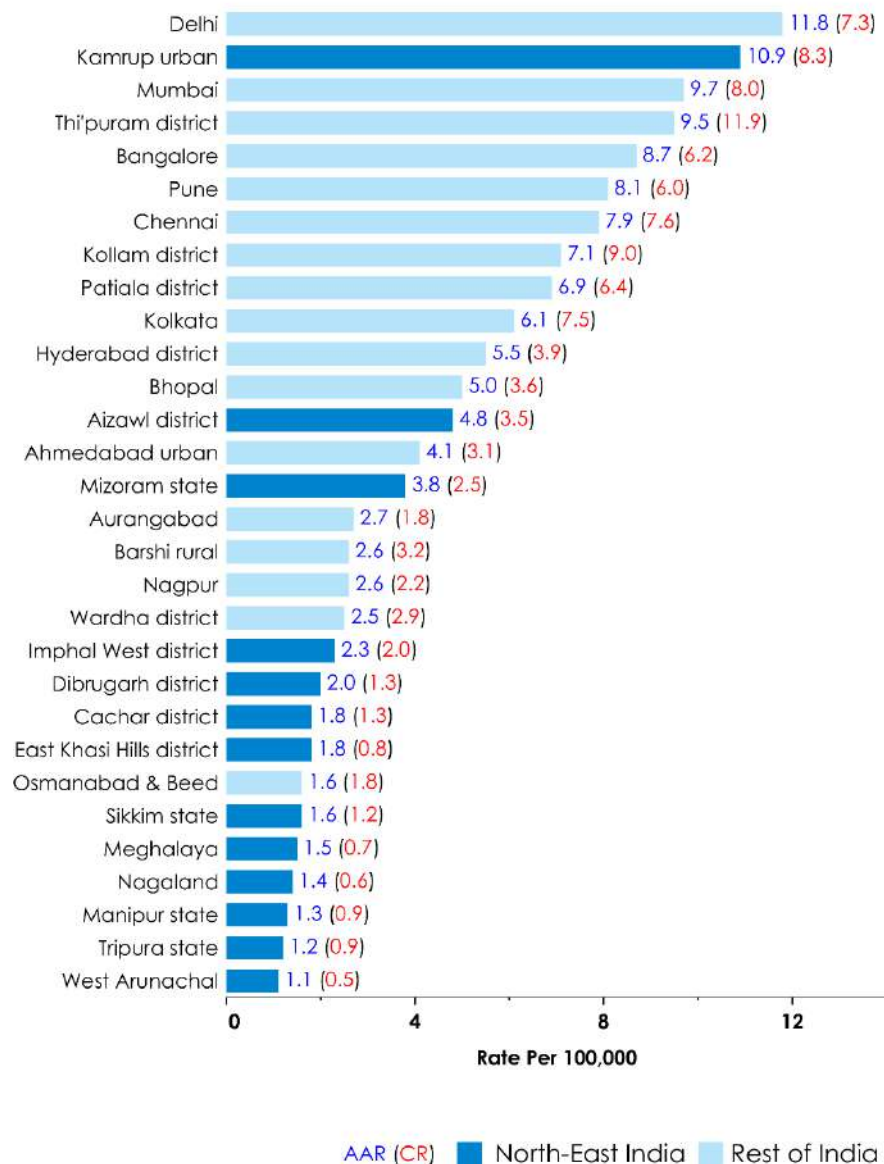


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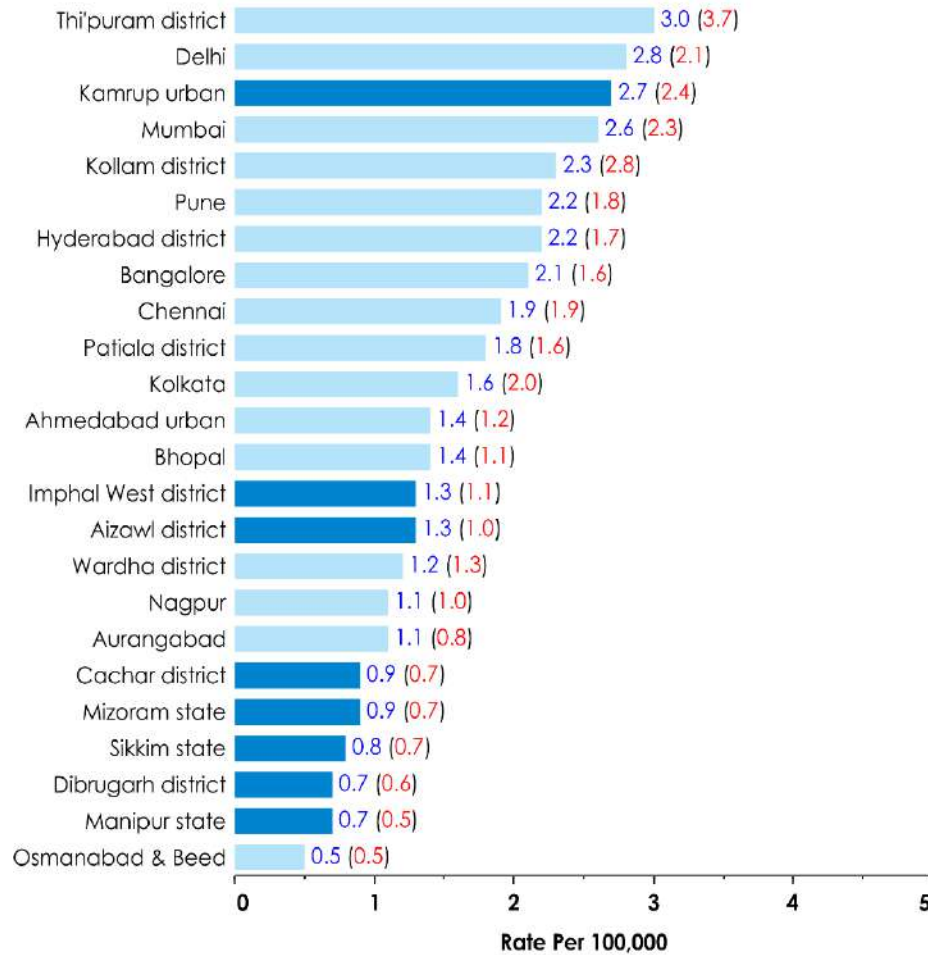


Prostate

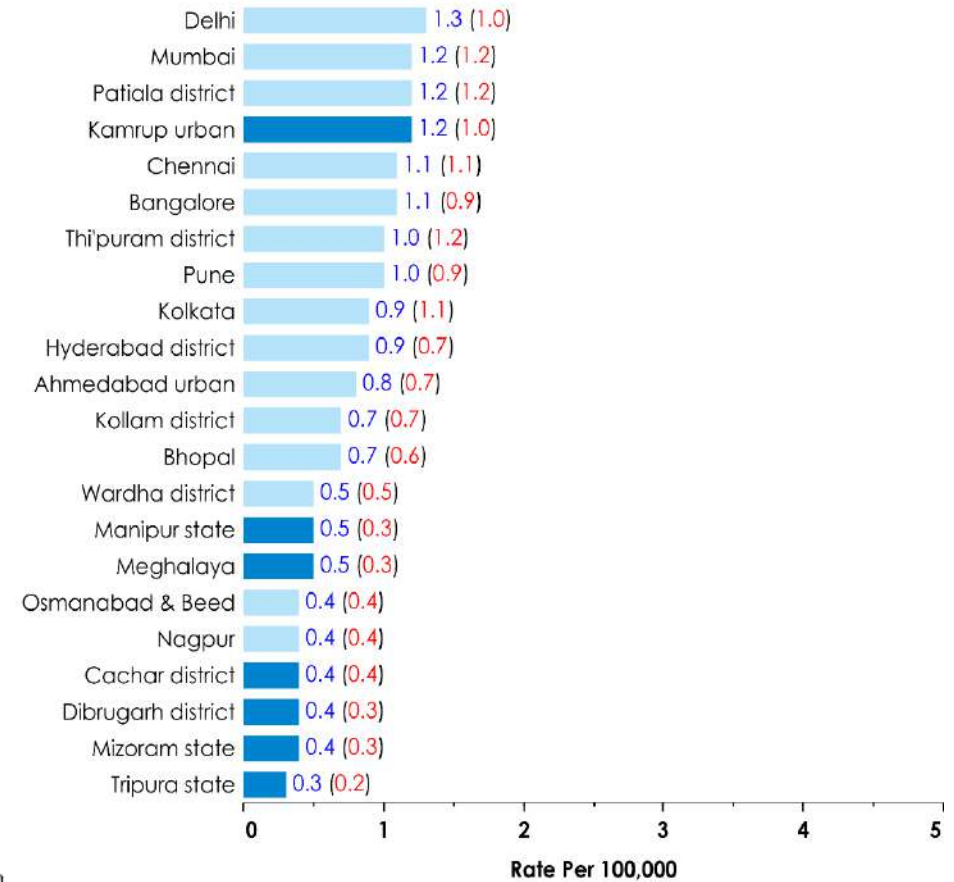




Kidney - Males



Kidney - Females

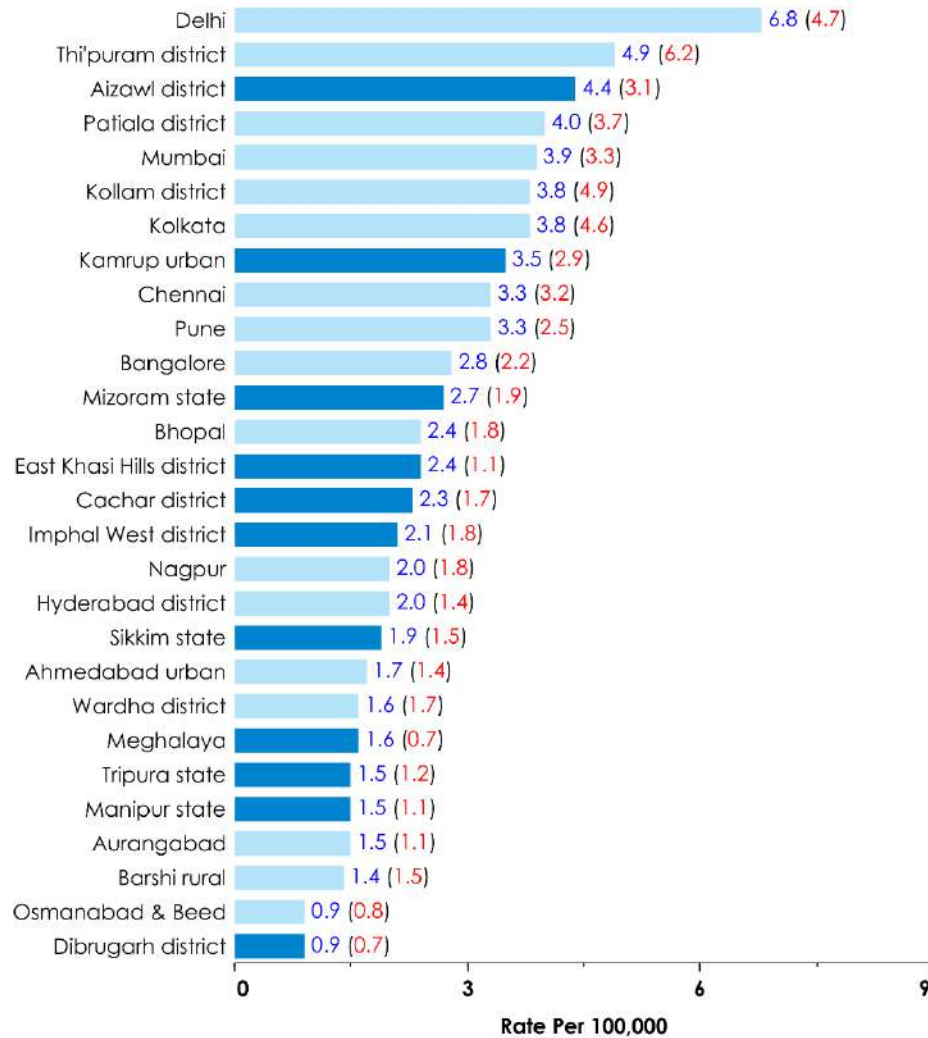


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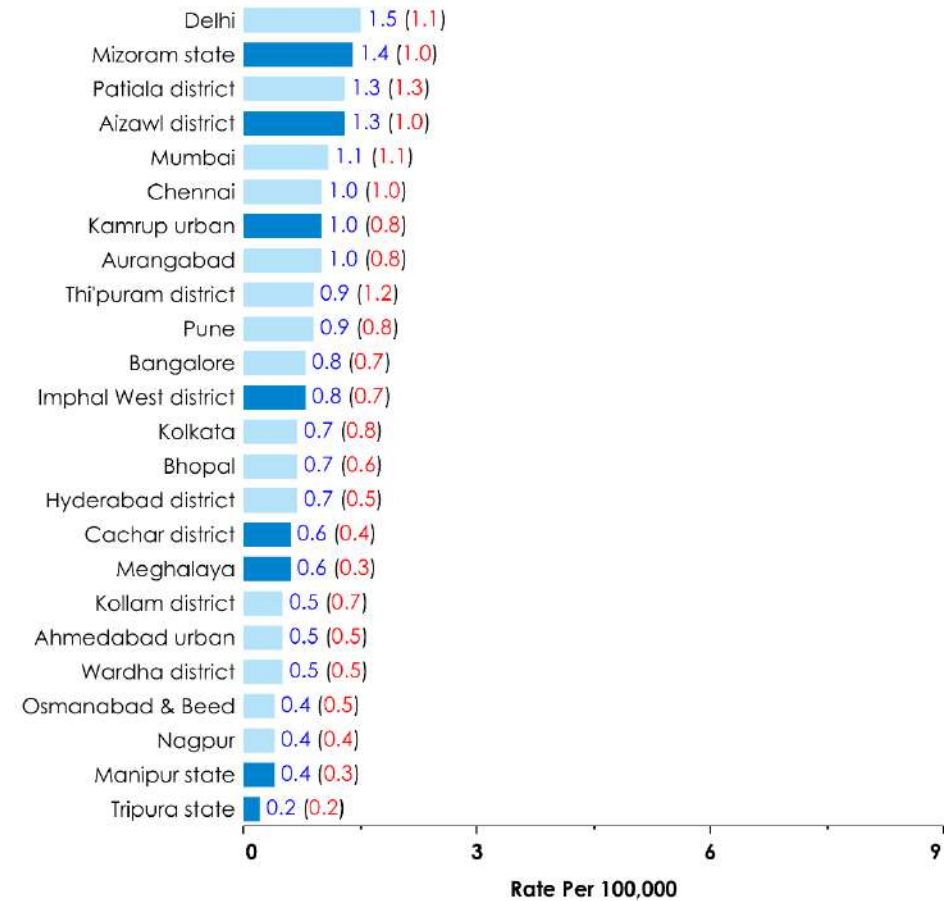




Urinary Bladder - Males



Urinary Bladder - Females

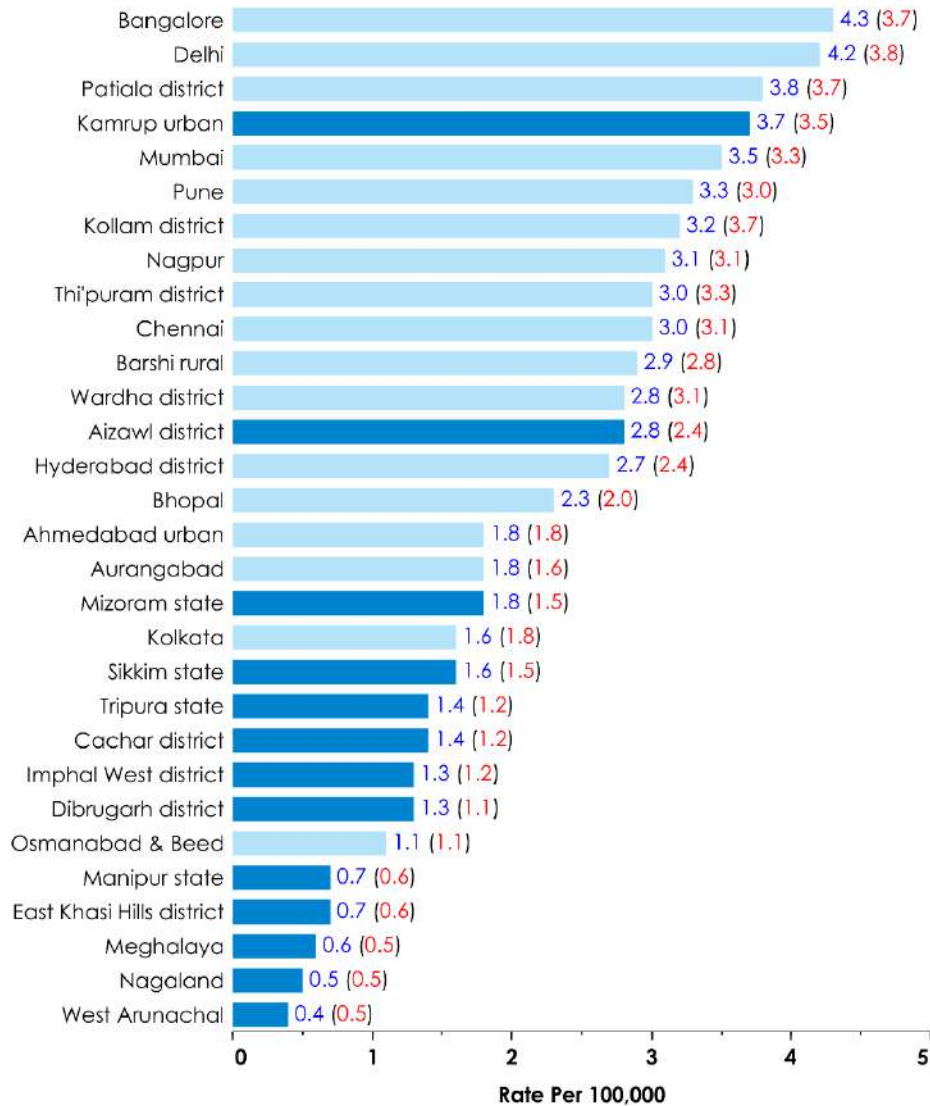


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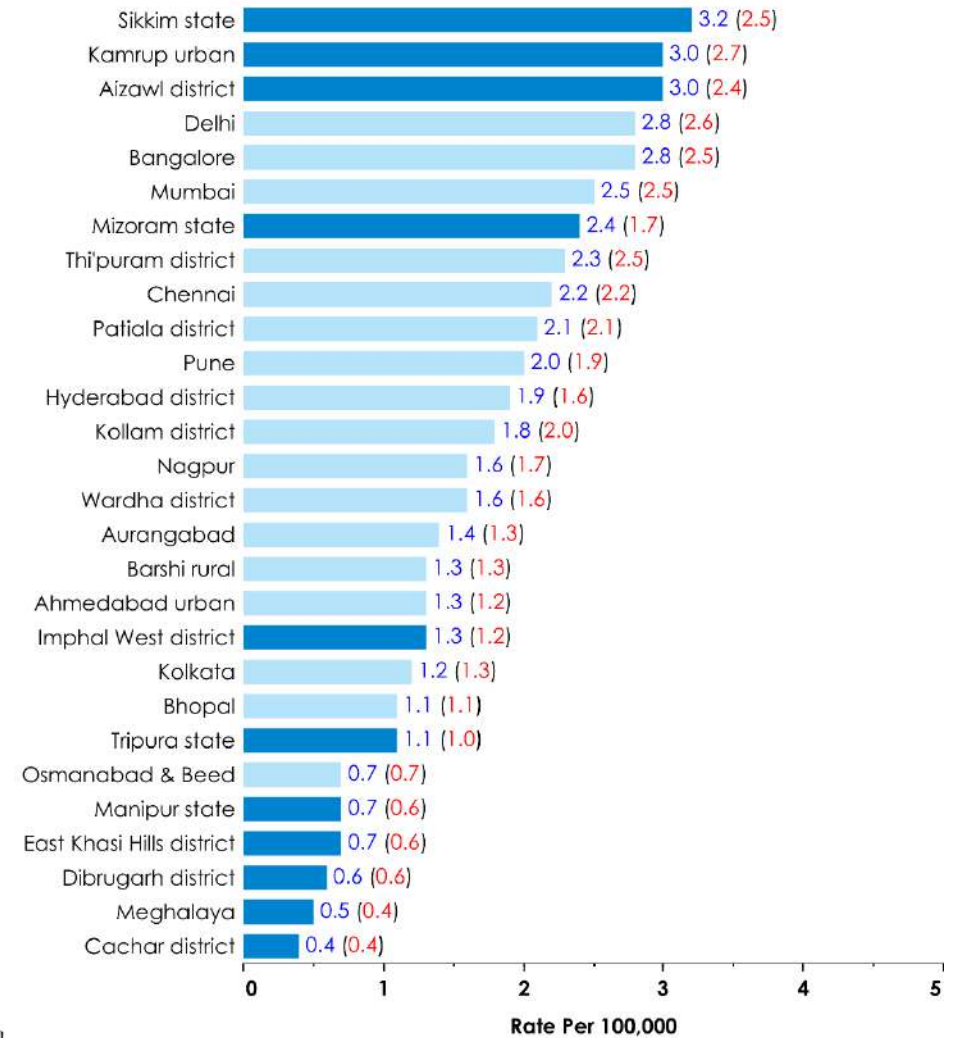




Brain, NS - Males



Brain, NS - Females

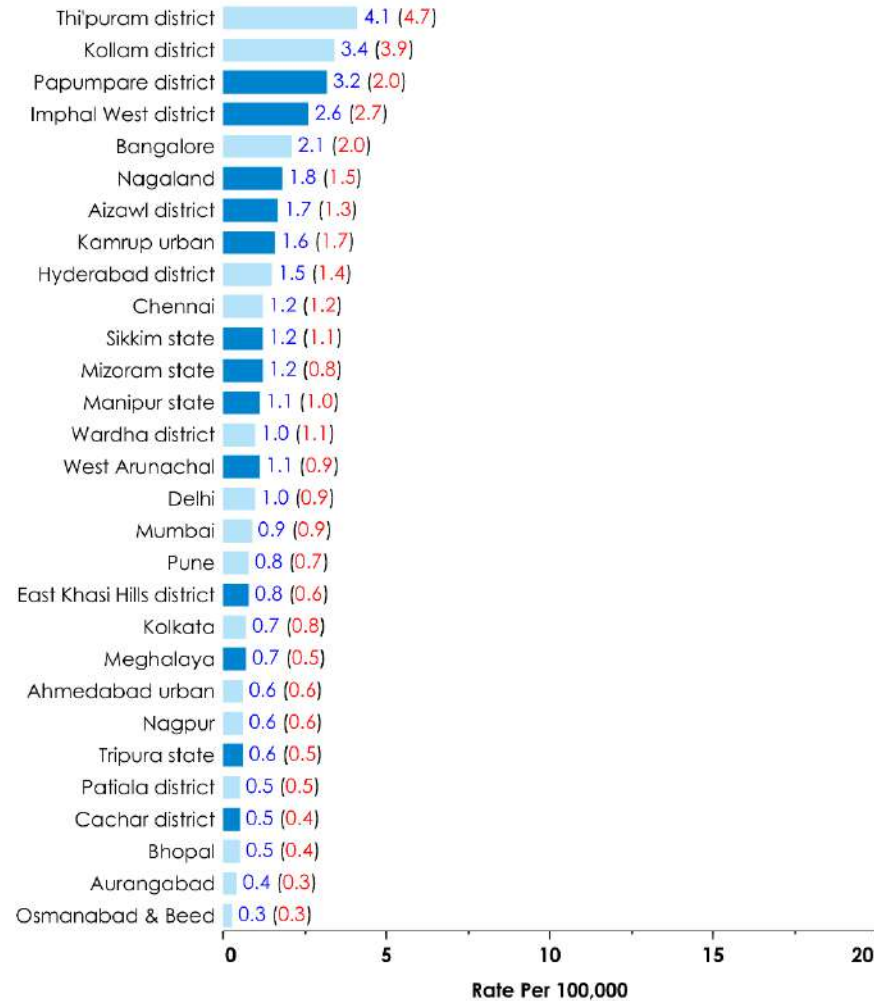


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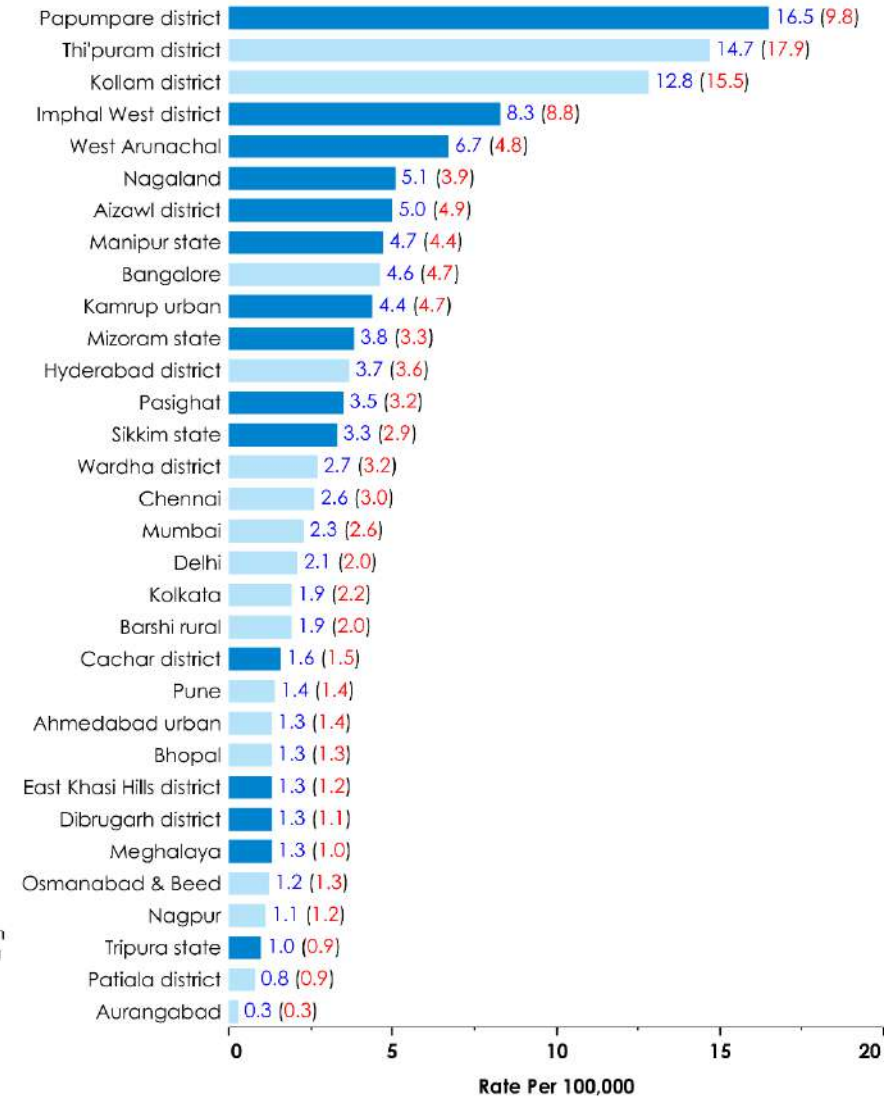




Thyroid - Males



Thyroid - Females

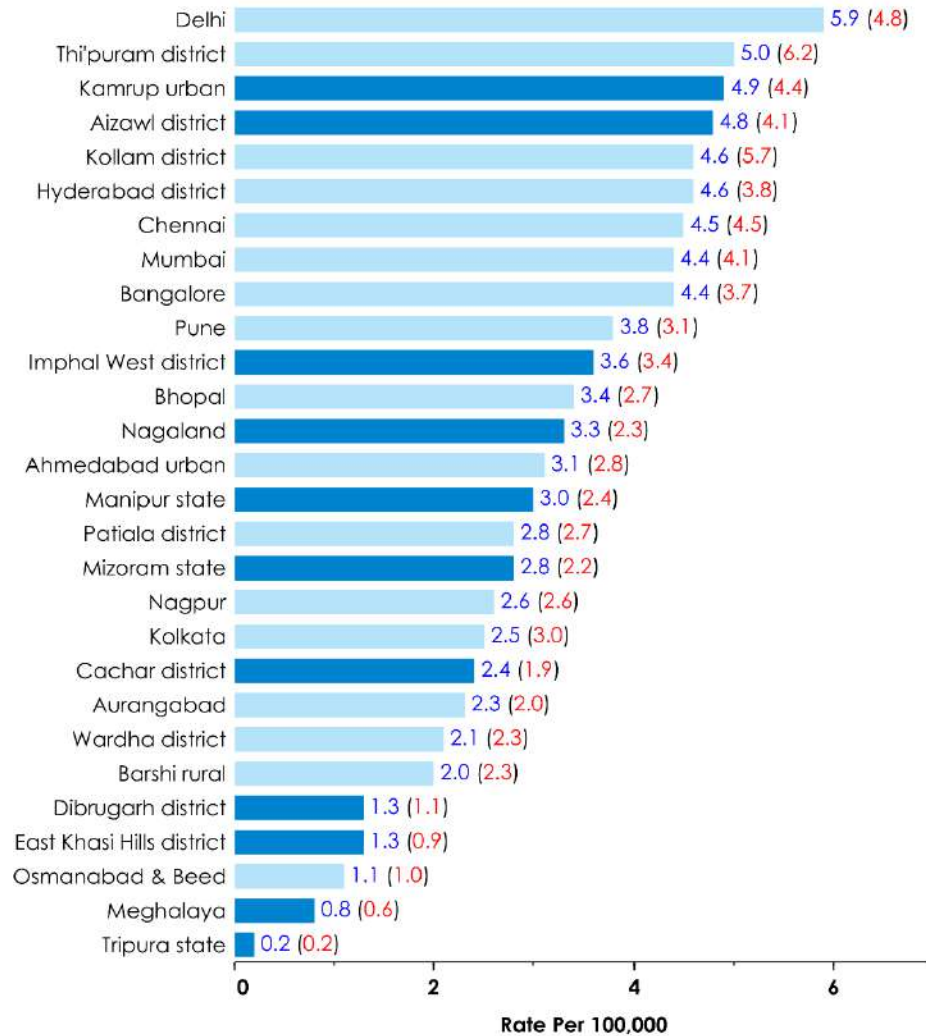


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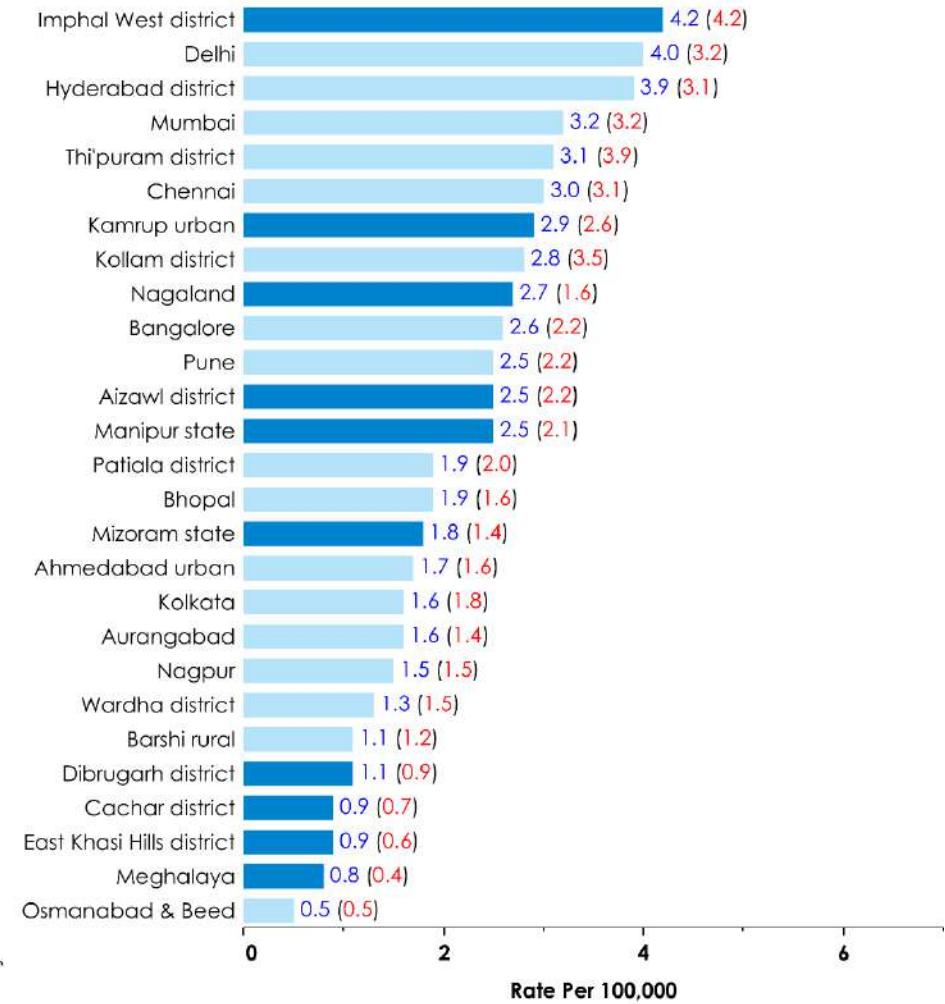




NHL - Males



NHL - Females



AAR (CR) ■ North-East India ■ Rest of India





1.11 Place of availing cancer directed treatment according to state

State of Residence	Within NER		Outside NER		Total
	Number	%	Number	%	Number
Arunachal Pradesh	950	86.8	144	13.2	1094
Assam	53287	94.9	2842	5.1	56129
Manipur	3647	83.6	713	16.4	4360
Meghalaya	1202	87.2	176	12.8	1378
Mizoram	2946	93.5	206	6.5	3152
Nagaland	725	41.9	1004	58.1	1729
Sikkim	9	4.7	184	95.3	193
Tripura	6594	93.1	489	6.9	7083

The proportion of cancer patients who sought treatment outside NER is reported to be more for Sikkim (95.3%) and Nagaland (58.1%), whereas the proportion for the same is less for Assam (5.1%), Mizoram (6.5%) and Tripura (6.9%).



1.12 Projected number of incidence cases by Anatomical Sites of Cancer in North East for year 2020 and 2025

Site Name	Males		Females		Total	
	2020	2025	2020	2025	2020	2025
All Sites	27503	30985	22814	26146	50317	57131
Tongue	1386	1563	477	548	1863	2111
Mouth	1658	1866	919	1056	2577	2922
Hypopharynx	2455	2767	423	480	2878	3247
Oesophagus	3870	4351	1915	2193	5785	6544
Stomach	1935	2180	1152	1330	3087	3510
Colon	671	752	456	522	1127	1274
Rectum	657	743	449	517	1106	1260
Liver	850	954	445	513	1295	1467
Gall Bladder	992	1115	2027	2310	3019	3425
Pancreas	259	295	172	200	431	495
Larynx	1136	1279	184	214	1320	1493
Lung	2385	2687	1028	1184	3413	3871
Breast	55	68	3619	4126	3674	4194



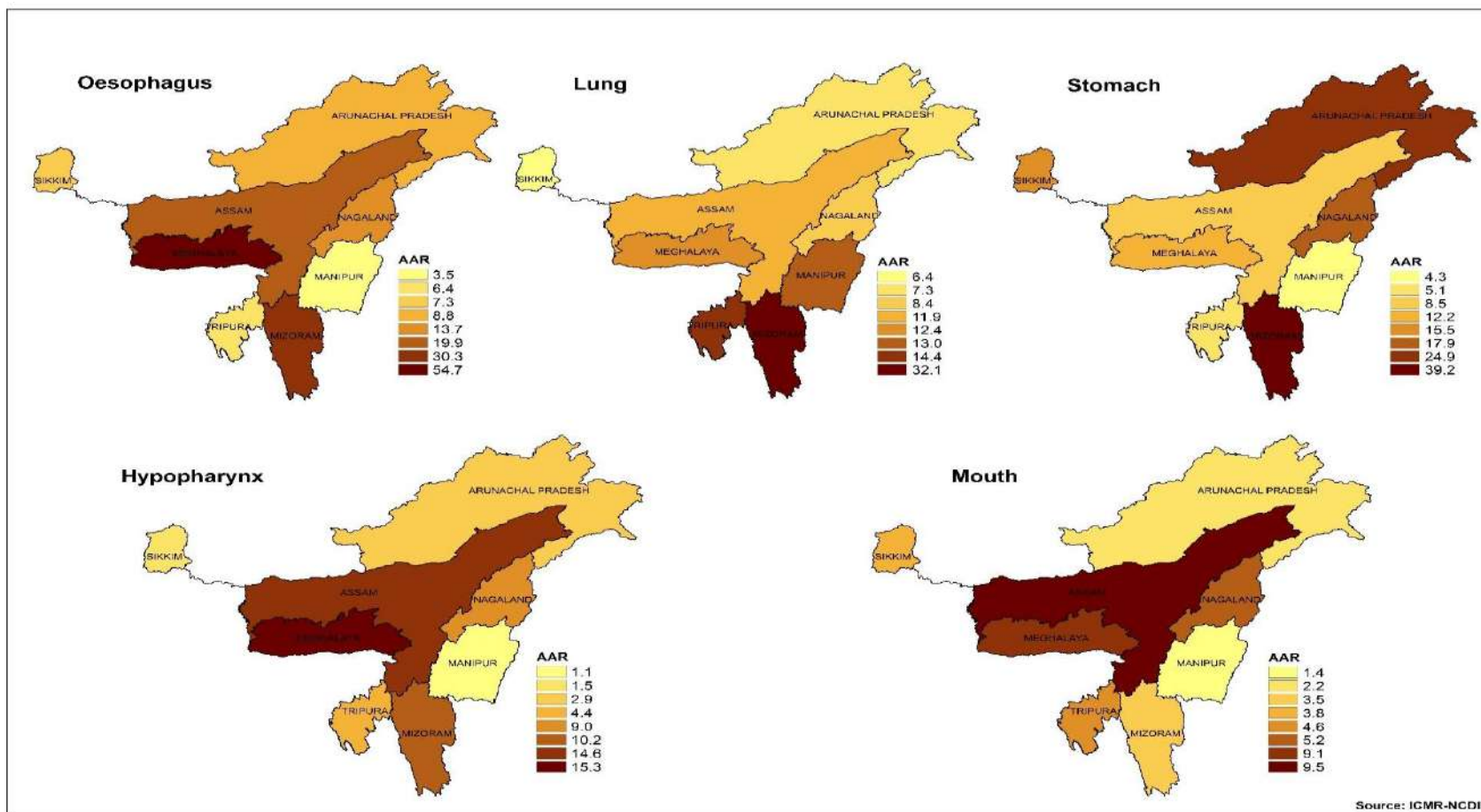
Site Name	Males		Females		Total	
	2020	2025	2020	2025	2020	2025
Cervix Uteri	-	-	2559	2936	2559	2936
Corpus Uteri	-	-	328	377	328	377
Ovary	-	-	1323	1506	1323	1506
Prostate	675	762	-	-	675	762
Kidney	245	280	114	132	359	412
Urinary Bladder	398	448	110	131	508	579
Brain, NS	389	435	252	284	641	719
Thyroid	192	228	639	731	831	959
NHL	528	590	310	360	838	950
Lymphoid Leukemia	211	232	89	102	300	334
Myeloid Leukemia	290	319	249	285	539	604

The projected number of cancer cases for 2020 was calculated to be 50317 (27503 in males and 22814 in females). The projected number of cancer cases for the year 2025, is estimated to be 57131 (30985 in males and 26146 in females). Among males, cancers of the oesophagus (4351) and among females, breast cancer (4126) are estimated to be the highest by 2025. The likely increase in total number of cancer cases will be 13.5% by 2025.



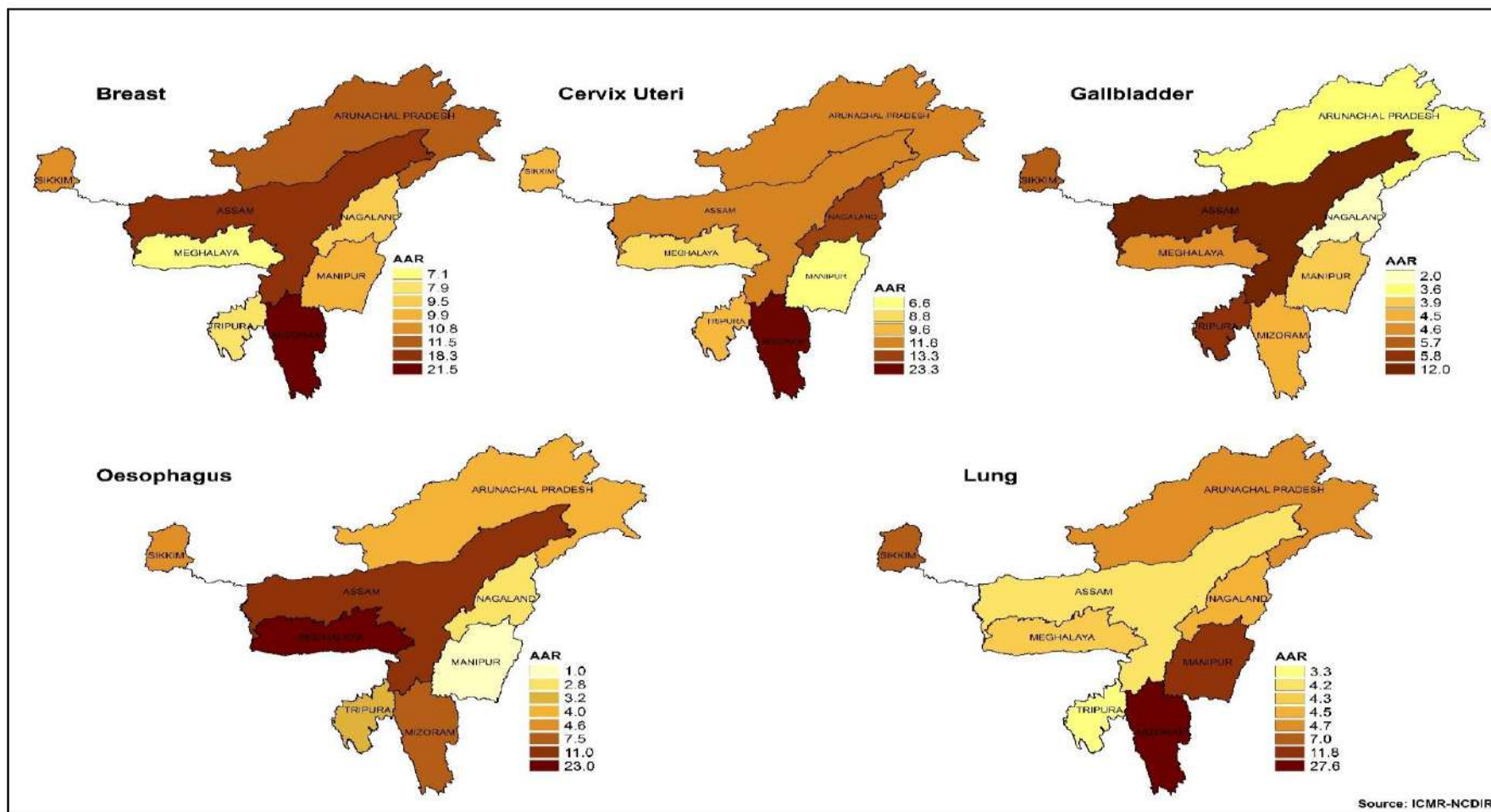
1.13 Projected Age adjusted Incidence Rate (AAR) for NER states for the leading sites of cancer - 2020

Males





Females

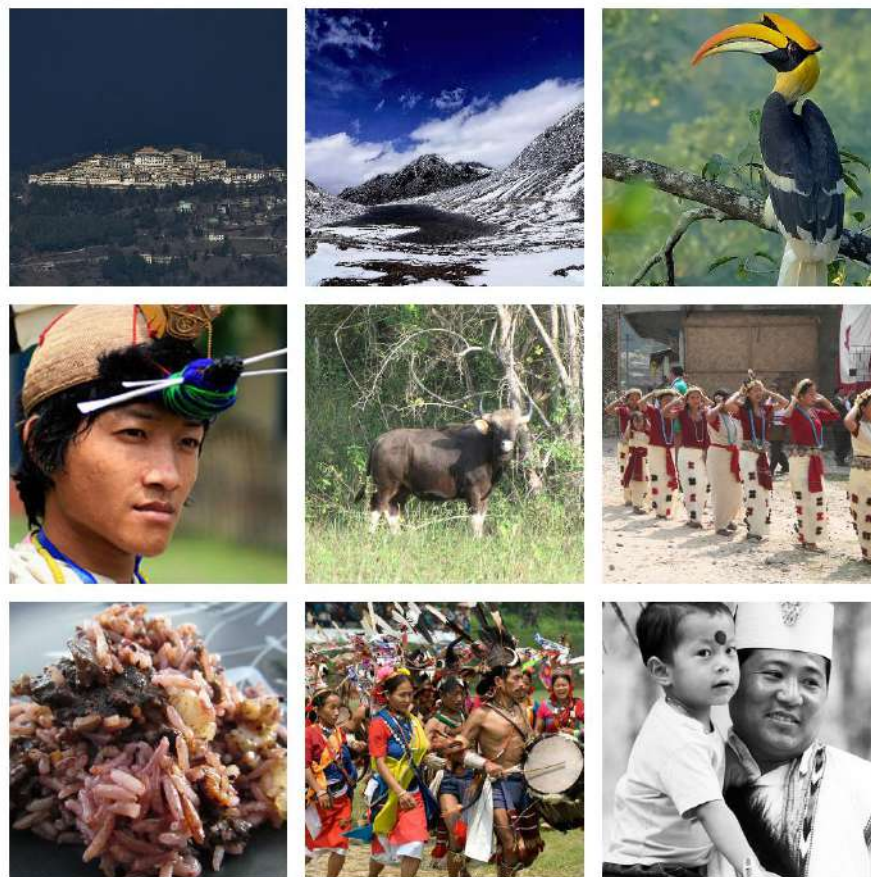


The projected AARs for 2020, in males is highest for oesophageal cancer in the state of Meghalaya (54.7 per 100,000) and in females it is highest for breast cancer in the state of Mizoram.





ARUNACHAL PRADESH



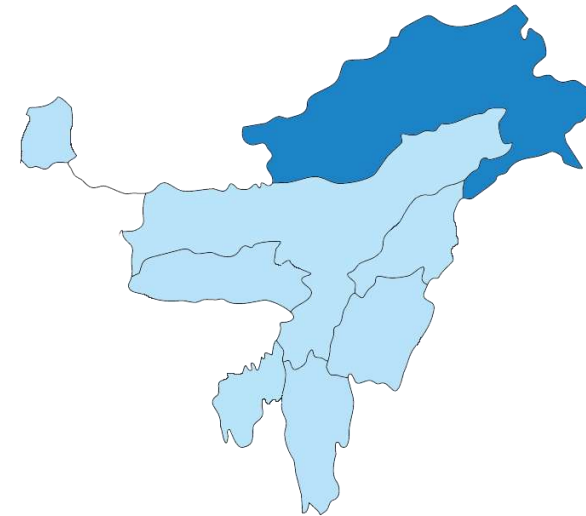


Chapter 2: Cancer and health status profile of Arunachal Pradesh

A. Health Status Profile

2.1 Socio-demographic profile [1]

Population (Total)	1383727
Number of males	713912
Number of females	669815
Sex Ratio	938
Major ethnic groups	Nyishi, Galo, Monpa, Adi, Nepalese, Mishing
Literacy rate (%)	
Total	65.4
Males	72.6
Females	57.7



The total population of the region is 1383727, with a sex ratio of 938. The total literacy rate is 65.4%, being 72.6 % in males and 57.7% in females. The major ethnic groups include Nyishi, Galo, Monpa, Adi, Nepalese and Mishing.



2.2. NCD related Risk factor profile

Behavioural and lifestyle-related							
Tobacco use ^[2]							
Current tobacco use-smoked and/or smokeless (age 15 years and above) (%)							
Total						45.5	
Males						61.1	
Females						28.7	
Current smoked tobacco use (age 15 or above) (%)							
Total						22.7	
Males						38.7	
Females						5.4	
Current smokeless tobacco use (age 15 or above) (%)							
Total						39.3	
Males						50.1	
Females						27.7	
Alcohol consumption ^[4]							
	Urban		Rural		Total		
	Men	Women	Men	Women	Men	Women	
Age 15 years or above (%)	55.3	22.3	60.5	27.8	59.0	26.3	
Metabolic risk factors ^[4]							
Overweight/Obese BMI >25 (age 15-49 years) (%)	26.0	25.8	18.4	16.3	20.6	18.8	
Raised blood pressure age (15 -49 years) (%)	5.0	3.0	3.5	2.7	3.9	2.8	
Raised blood glucose (random) age (15-49 years) (%)	6.2	4.8	8.1	4.8	7.6	4.8	
Air Pollution, DALYs per 100,000 ^[3]	1663.81						

The prevalence of current tobacco use is 45.5%, higher for the smokeless form (39.3%) than the smoked form (22.7%). The DALYs' due to air pollution is reported to be 1663.81 per 100,000. Over half, (59.0%) of males over the age of 15 years consumed alcohol, while the proportion of alcohol use in females was 26.3%. 20.6% of the men in the age group of 15-49 years are obese, slightly higher than female prevalence (18.8%). A somewhat higher proportion of males (3.9%) have raised blood pressure than females (2.8%). The prevalence of raised blood glucose is 4.8% in women and 7.6% in men.



2.3 Mortality related statistics

Life expectancy (2016) ^[5]	
Males	68.2 years
Females	72.7 years
Leading causes of death (MCCD 2018) ^[6]	
Major Cause Group	Percentage
Certain infections & Parasitic Diseases	25.4
Circulatory System	13.5
Neoplasms	6.5
Other Groups	6.1
Certain Conditions originating in Perinatal Period	4.9
Status of Medical certification of cause of death ^[6]	
Percentage of Medically Certified Deaths to Total Registered Deaths (%)	32.9
Medical Institutions covered under MCCD	188
Medical Institutions Reported MCCD Data as per the National List	41
Ranking of States/UTs in the medical certification of cause of death 2018	16

The life expectancy is marginally higher in females (72.7 years) than males (68.2 years). Infections and parasitic infestations (25.4%) and circulatory system causes (13.5%) comprise death's leading causes. The percentage of medically certified deaths to total registered deaths is 32.9%. The state ranks sixteenth in the medical certification of cause of death.



2.4 Health seeking behaviour and health practices^[4]

	Urban	Rural	Total
History of cancer screening			
Women aged 15-49 ever undergone a breast examination for breast cancer (%)	7.2	5.4	5.9
Women aged 15-49 ever undergone an oral cavity examination for oral cancer (%)	24.8	14.9	17.5
Women aged 15-49 ever undergone screening for cervical cancer (%)	10.4	7.9	8.5
Immunization history			
Children aged 12-23 months who have received 3 doses of hepatitis B vaccine (%)	50.1	38.1	40.9
Household profile			
Population living in households that use an improved sanitation facility (%)	73.3	57.1	61.3
Households using clean fuel for cooking (%)	87.4	30.0	45.0
Households with any usual member covered under a health insurance/financing scheme (%)	54.4	59.7	58.3

The proportion of women who have undergone screening is 5.9% for breast cancer, 17.5 % for oral cancer and 8.5% for cervical cancer. Only 40.9% of children in 12 to 23 months had received immunization with hepatitis B vaccine. About 61.3% of the population is living in households that use an improved sanitation facility—nearly half (45.0%) of the population are using clean fuel for cooking. The coverage with a health insurance scheme or financing scheme is 58.3%.



2.5 Status of the health system

A. Public sector health facilities^{[7],[8]}	Number
Sub centres (SC)	307
Health and Wellness Centre - Sub Centre (HWC-SC)	78
Primary Health Centres (PHC)	105
Health and Wellness Centre - Primary Health Centre (HWC-PHC)	42
Community Health Centres (CHC)	63
Sub-district Hospitals (SDH)	00
District Hospitals (DH)	17
Number of government allopathic doctors and dental surgeons	322
B. Tertiary health care facilities	
Medical Colleges ^[9]	01
State cancer institute ^[10]	00
Tertiary cancer care centre ^[10]	00
Regional cancer care centre ^[11]	00
C. State government health scheme ^[12]	Chief Minister's Arogya Arunachal Yojna (CMAAY)

The state has 307 SCs, 78 HWC-SCs, 105 PHCs, 42 HWC-PHCs, 63 CHCs and 17 DHs. There is only one medical college. The state implements government health scheme known as Chief Minister's Arogya Arunachal Yojna (CMAAY).



A. Profile of Cancer

2.6 Details of Cancer Registries in the State

Population Based Cancer Registry	West Arunachal - PBCR	Pasighat - PBCR
Location	Tomo Riba Institute of Health & Medical Science, Naharlagun	General Hospital, Pasighat
Established Year	2011	2011
Coverage Area	Tawang, West Kameng, East Kameng, Upper Subansiri, Lower Subansiri, Kurung Kumey, Papumpare & West Siang	East Siang and Upper Siang
Sources of registration	23	31
Area (in Sq.km)	42095	10193
Urban & Rural (%)	25.8 & 74.2	25.4 & 74.6

The two Population-Based Cancer Registries are located at Tomo Riba Institute of Health & Medical Science in Naharlagun and General Hospital in Pasighat. The PBCR at Naharlagun covers Tawang, West Kameng, East Kameng, Upper Subansiri, Lower Subansiri, Kurung Kumey, Papumpare & West Siang through 23 sources of registration for the year 2012-2016. The PBCR which is situated at Pasighat covers East Siang and Upper Siang through 31 sources of registration.

2.7 Number of cancer cases and Age Adjusted Incidence Rate (AAR) per 1,00,000 population

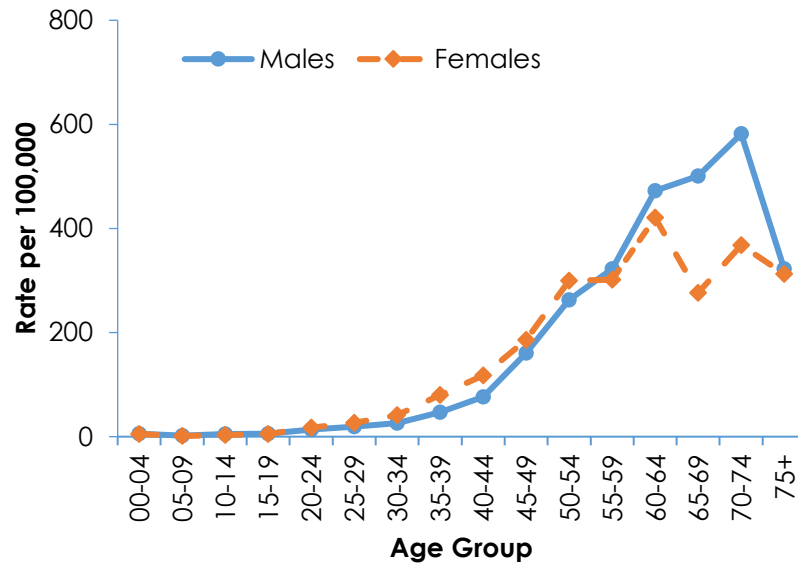
Gender	West Arunachal		Pasighat	
	Number of New Cancer Cases	AAR	Number of New Cancer Cases	AAR
Males	1222	101.1	321	120.4
Females	1171	96.3	303	116.2

The AAR is higher in males (101.1 per 100,000 males) than females (96.3 per 100,000 females) in West Arunachal. Similarly, in Pasighat, the AAR is higher in males (120.4 per 100,000 males) than females (116.2 per 100,000 females).



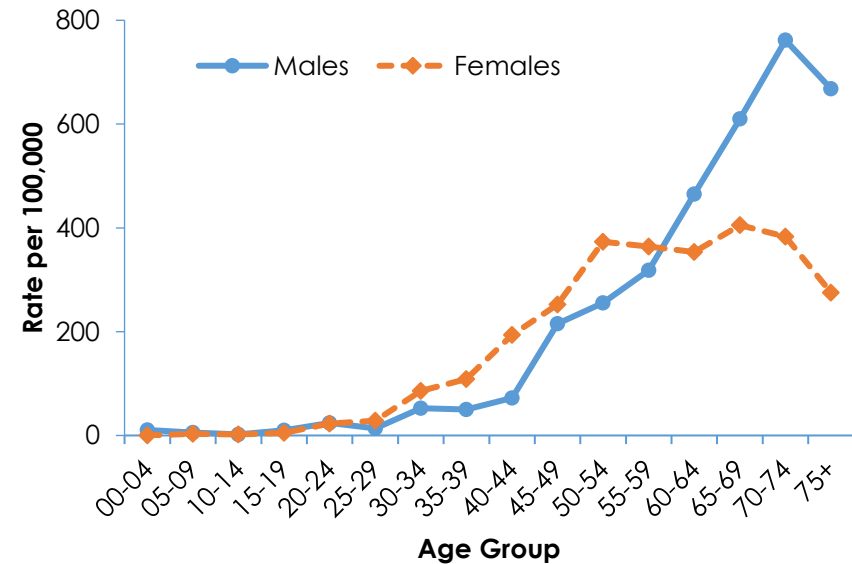
2.8 Age Specific Incidence Rate (ASPr) per 100,000 population

2.8.1 West Arunachal



The Age-Specific Incidence Rates in both the genders show a rise from 25-29 years age-group onwards. In males, the highest Age-Specific Incidence Rate is seen in the 70-74 years age-group while in females, the highest Age-Specific Incidence Rate is in the 60-64 years age-group.

2.8.2 Pasighat



The Age-Specific Incidence Rates in both the genders show a rise from 25-29 years age-group onwards. In males, the highest Age-Specific Incidence Rate is seen in the 70-74 years age-group while in females, the highest Age-Specific Incidence Rate is in the 65-69 years age-group.

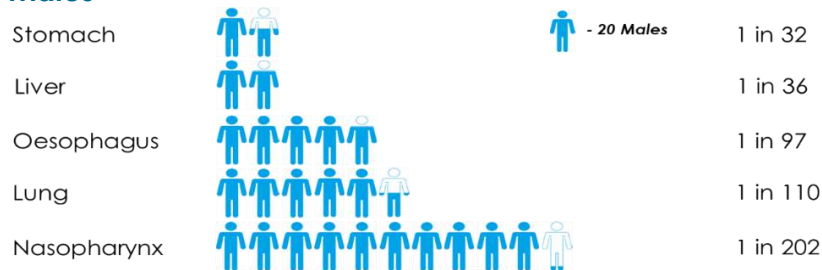




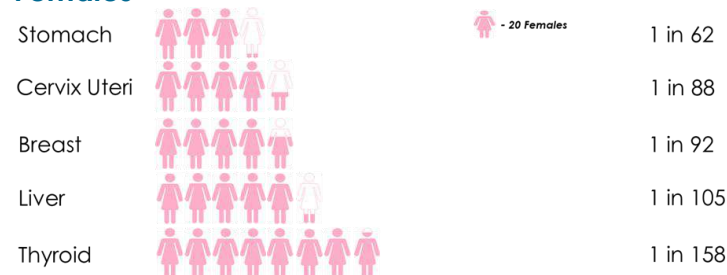
2.9 Probability of One in number of Persons developing cancer in 0-74 years age

West Arunachal

Males



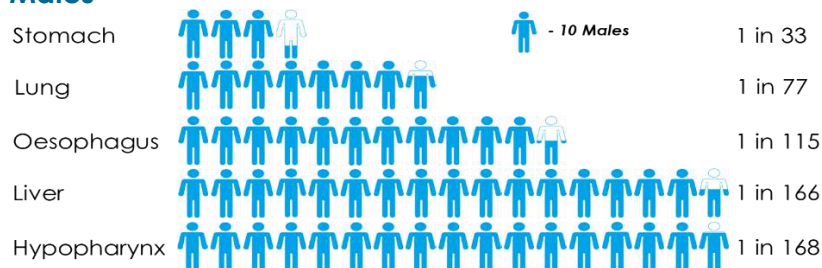
Females



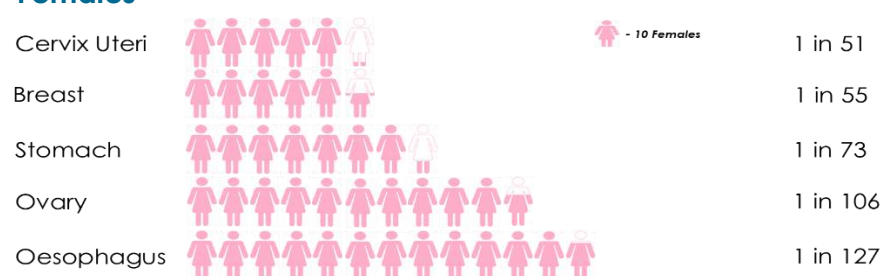
In West Arunachal, the probability of developing stomach cancer is the highest in both the genders (1 in every 32 males and 1 in every 62 females), followed by liver cancer in males (1 in every 36 males) and cervical cancer in females (1 in every 88 females).

Pasighat

Males



Females

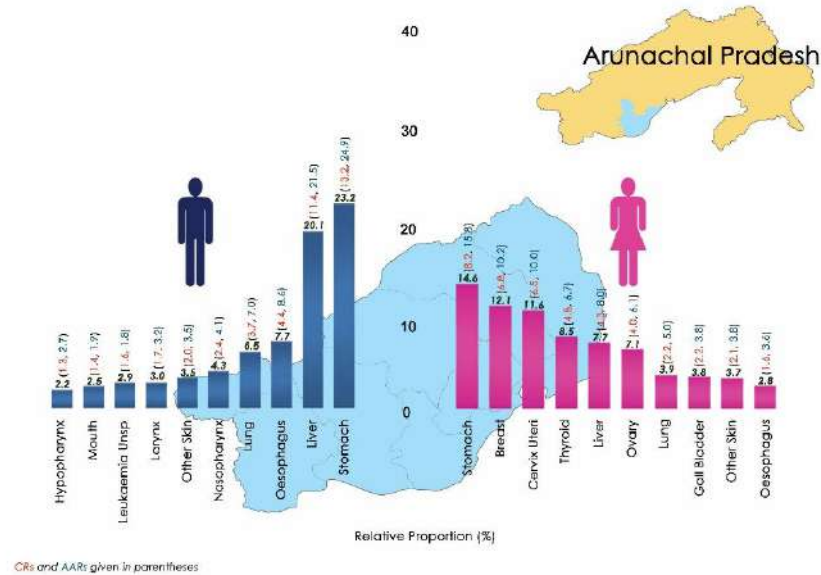


In Pasighat, the probability of developing stomach cancer is the highest in males (1 in every 33 males) followed by lung cancer (1 in every 77 males). In females, the probability of developing cancer of cervix uteri is highest (1 in every 51 females) followed by breast cancer (1 in every 55 females).



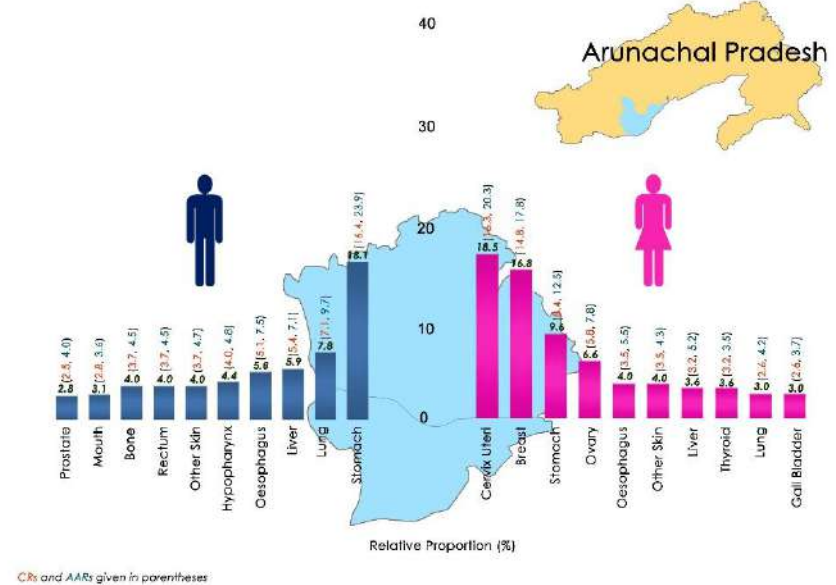
2.10 Leading Anatomical Sites of Cancer

2.10.1 West Arunachal



In West Arunachal, the proportion of stomach cancer (23.2%) is highest among males, followed by liver cancer (20.1%) and cancer of oesophagus (7.7%). In females, the stomach is a leading cancer site (14.6%) followed by breast (12.1%) and cervix uteri (11.6%).

2.10.2 Pasighat



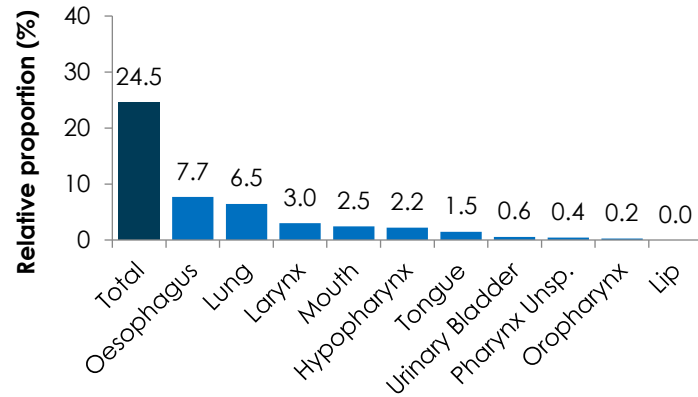
In Pasighat, the proportion of stomach cancer (18.1%) is highest among males, followed by the lung cancer (7.8%) and cancer of liver (5.9%). In females, the cervix uteri is a leading cancer site (18.5%) followed by breast (16.8%) and stomach (9.6%).



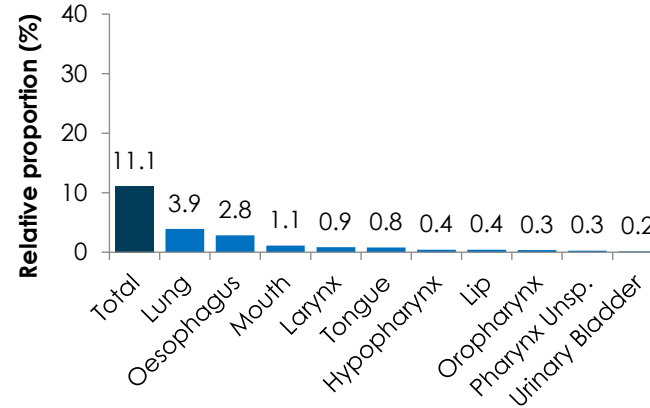
2.11 Relative Proportion (%) of Cancer Sites Associated with the Use of Tobacco

2.11.1 West Arunachal

Males



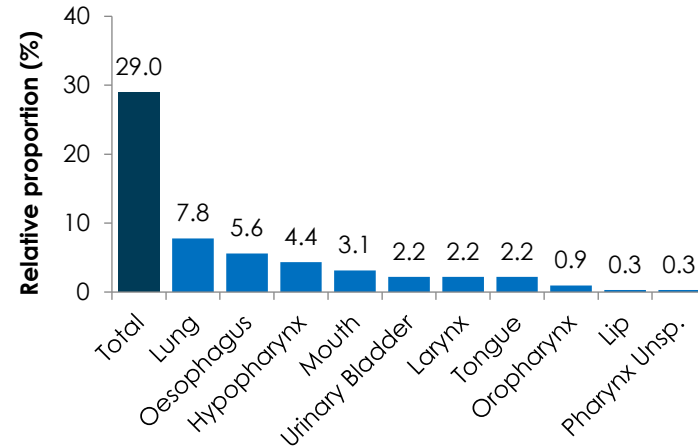
Females



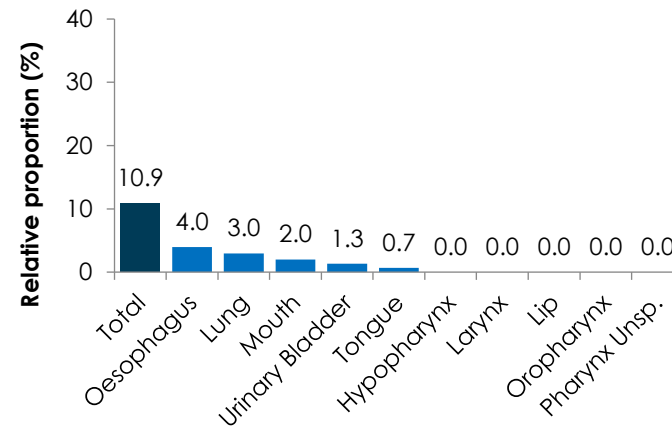
Nearly one-fourth (24.5%) cancers in males and close to one-tenth (11.1%) in females are tobacco use related cancer sites. Among these, oesophagus (7.7% in males; 2.8% in females) followed by lung (6.5% in males; 3.9% in females) constitute the leading sites in both the genders.

2.11.2 Pasighat

Males



Females



About 29.0% of the cancers in males and 10.9% in females are tobacco use related cancer sites. Among these, cancers of the oesophagus (5.6% in males; 4.0% in females) and lung (7.8% in males, 3.0% in females) are the top two leading sites.





2.12 Distribution of cancers according to ethnicity

2.12.1 West Arunachal

Name of Ethnic Group	Number	%
Nyishi	797	33.3
Galo	326	13.6
Apatani	172	7.2
Tagin	161	6.7
Monpa	134	5.6
Adi	109	4.6
Nepalese	106	4.4
Ahom	46	1.9
Others	248	10.4

Total may not be 100%, because unspecified/unknown ethnic group cases are excluded.

Among all the ethnic groups, half of cancer cases are recorded in the Nyishi and Galo ethnic group.

2.12.2 Pasighat

Name of Ethnic Group	Number	%
Adi	398	63.8
Nepalese	59	9.5
Mishing	29	4.6
Galo	20	3.2
Boro	7	1.1
Others	65	10.4

Total may not be 100%, because unspecified/unknown ethnic group cases are excluded.

Among the ethnic groups, close to two thirds (63.8%) of cancer cases are reported in the Adi ethnic group



2.13 Case-Fatality Ratio

2.13.1 West Arunachal

Case Fatality Ratio (CFR)			
West Arunachal	Incidence	Death	CFR%
Males	1222	321	26.3
Females	1171	202	17.3
Total	2393	523	21.9

The total case fatality ratio is 21.9% in West Arunachal, higher in males (26.3%) than females (17.3%).

2.13.2 Pasighat

Case Fatality Ratio (CFR)			
Pasighat	Incidence	Death	CFR%
Males	321	74	23.1
Females	303	52	17.2
Total	624	126	20.2

The total case fatality ratio is 20.2% in Pasighat, higher in males (23.1%) than females (17.2%).

Key Observations:

- Cancer ranks among the top five leading causes of death in the state.
- Cancer of the stomach and liver are among the top leading sites in both genders.
- In women, stomach cancer is the leading site in West Arunachal.
- Nearly two third of the male and one third of female population are current tobacco users.
- Alcohol consumption is reported in more than half of the males and quarter of the females.
- Immunization coverage with hepatitis B vaccine is less than 50.0%.
- The cause of death is medically certified in close to one third of the deaths.
- The state has a scarcity of tertiary cancer care services.



ASSAM



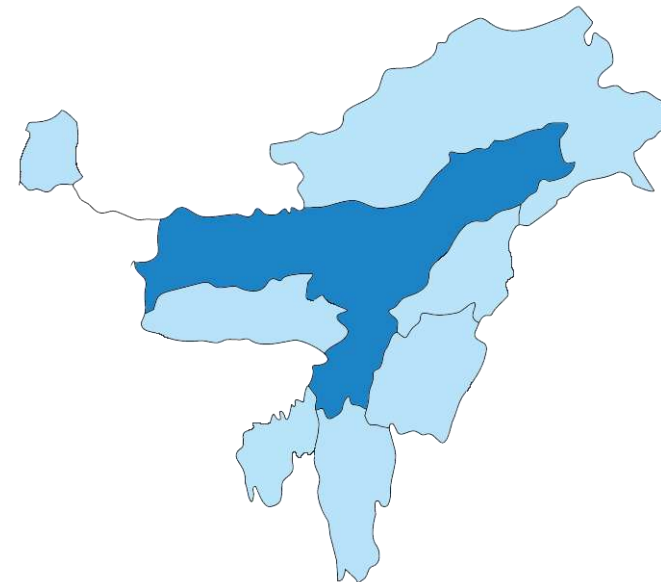


Chapter 3: Cancer and health status profile of Assam

A. Health Status Profile

3.1 Socio-demographic profile [1]

Population (Total)	31205576
Number of males	15939443
Number of females	15266133
Sex Ratio	958
Major ethnic groups	Kayastha, Ahom, Tea-tribe, Kachari, Kalita, Brahmin, Koibarta
Literacy rate (%)	
Total	72.2
Males	77.9
Females	66.3



The total population of the state is 31205576, with a sex ratio of 958. The total literacy rate is 72.2%, being 77.9% in males and 66.3% in females. The major ethnic groups include Kayastha, Ahom, Tea-tribe, Kachari, Kalita, Brahmin and Koibarta.



3.2. NCD related Risk factor profile

Behavioural and lifestyle-related						
Tobacco use ^[2]						
Current tobacco use-smoked and/or smokeless (age 15 years and above) (%)						
Total	48.2					
Males	62.9					
Females	32.9					
Current smoked tobacco use (age 15 or above) (%)						
Total	13.3					
Males	25.3					
Females	0.8					
Current smokeless tobacco use (age 15 or above) (%)						
Total	41.7					
Males	50.5					
Females	32.5					
Alcohol consumption						
	Urban		Rural		Total	
	Men	Women	Men	Women	Men	Women
age 15 years or above (%) ^[13]	21.3	2.6	25.9	8.2	25.1	7.3
Metabolic risk factors ^[13]						
Overweight/Obese BMI >25 (age 15-49 years) (%)	25.4	23.8	14.5	13.6	16.2	15.2
Raised blood pressure (age 15 years or above) (%)	23.8	22.5	19.6	18.5	20.3	19.1
Raised blood glucose (random) (age 15 years or above) (%)	20.4	16.6	15.2	12.1	16.0	12.8
Air Pollution, DALYs per 100,000 ^[3]	3649.31					

The prevalence of current tobacco use is 48.2%, higher for the smokeless form (41.7%) than the smoked form (13.3%). The DALYs' due to air pollution is reported to be 3649.31 per 100,000. About a quarter (25.1%) of males over the age of 15 years consumed alcohol, while the proportion of alcohol use in females was 7.3%. 16.2% of the men in the age group of 15-49 years are obese, slightly higher than female prevalence (15.2%). A somewhat higher proportion of males (20.3%) have raised blood pressure than females (19.1%). The prevalence of raised blood glucose is 12.8% in women and 16.0% in men.



3.3 Mortality related statistics

Life expectancy (2016) ^[5]	
Males	63.5 years
Females	66.9 years
Leading causes of death (MCCD 2018) ^[6]	
Major Cause Group	Percentage
Certain infections & Parasitic Diseases	27.4
Endocrine, Nutritional and Metabolic diseases	18.9
Neoplasms	17.5
Circulatory System	14.5
Respiratory System	5.9
Status of Medical certification of cause of death	
Percentage of Medically Certified Deaths to Total Registered Deaths (%)	12.0
Medical Institutions covered under MCCD	1209
Medical Institutions Reported MCCD Data as per the National List	1209
Ranking of States/UTs in the medical certification of cause of death 2018	29

The life expectancy is marginally higher in females (66.9 years) than males (63.5 years). Certain infections & Parasitic Diseases causes comprise the leading cause of death (27.4%), followed by endocrine, nutritional and metabolic disorders (18.9%). The percentage of medically certified deaths to total registered deaths is only 12.0%. The state ranks 29th in the medical certification of cause of death.



3.4 Health seeking behaviour and health practices [13]

	Urban	Rural	Total
History of cancer screening			
Women aged 30-49 ever undergone a breast examination for breast cancer (%)	0.4	0.2	0.2
Women aged 30-49 ever undergone an oral cavity examination for oral Cancer (%)	0.4	0.2	0.2
Women aged 30-49 ever undergone screening for cervical Cancer (%)	0.6	0.1	0.2
Men aged 30-49 ever undergone an oral cavity examination for oral Cancer (%)	0.0	1.6	1.4
Immunization history			
Children aged 12-23 months who have received 3 doses of penta or hepatitis B vaccine (%)	72.7	75.4	75.1
Household profile			
Population living in households that use an improved sanitation facility (%)	69.7	68.4	68.6
Households using clean fuel for cooking (%)	85.5	33.7	42.1
Households with any usual member covered under a health insurance/financing scheme (%)	50.1	61.9	60.0

The proportion of women who have undergone screening is 0.2% for breast cancer, 0.2% for oral cancer and 0.2% for cervical cancer. Only 1.4% of men had a history of screening for oral cancer. As many as 75% of children in 12 to 23 months had received immunization with Penta and hepatitis B vaccine. About 68.6% of the population live in households that use an improved sanitation facility—only 42.1% of the people use clean fuel for cooking. The coverage with a health insurance scheme or financing scheme is 60%.



3.5 Status of the health system

A. Public sector health facilities ^{[7],[8]}	Number
Sub centres (SC)	4034
Health and Wellness Centre - Sub Centre (HWC-HC)	628
Primary Health Centres (PHC)	704
Health and Wellness Centre - Primary Health Centre (HWC-PHC)	297
Community Health Centres (CHC)	179
Sub-district Hospitals (SDH)	14
District Hospitals (DH)	25
Number of government allopathic doctors and dental surgeons	2558
Tertiary health care facilities	
Medical Colleges ^[9]	07
State cancer institute ^[10]	01
Tertiary cancer care centre ^[10]	00
Regional cancer care centre ^[11]	01
B. State government health scheme ^[14]	<ol style="list-style-type: none"> 1. The Assam Arogya Nidhi (AAN) 2. Atal Amrit Abhiyan 3. Chief Minister's Free Diagnostic Services

The state has 4034 SCs, 628 HWCs – SCs, 704 PHCs', 297 HWC – PHCs, 179 CHCs', 14 SDHs and 25 DHs. There are seven medical colleges and one State Cancer Institute and Regional Cancer Centre. The state implements health schemes known as 'The Assam Arogya Nidhi (AAN)', 'Atal Amrit Abhiyan' and Chief Minister's Free Diagnostic Services.



B. Profile of Cancer

3.6 Details of Cancer Registries in the State

Population Based Cancer Registry			
Population Based Cancer Registry	Cachar district - PBCR	Dibrugarh district - PBCR	Kamrup urban - PBCR
Location	Silchar Medical College, Silchar	Assam Medical College & Hospital, Dibrugarh	Dr. B. Borooah Cancer Institute, Guwahati
Established Year	2003	2003	2003
Coverage Area	Silchar Town Up to 2006 & Cachar district from 2007	Dibrugarh district	Urban Areas of Kamrup district & Kamrup Metropolitan district
Sources of Registration (SoR)	33	42	81
Area (in Sq.km)	3786	3381	336
Urban & Rural (%)	18.2 & 81.8	18.4 & 81.6	100.0 & 0.0
Hospital Based Cancer Registries	<ol style="list-style-type: none"> 1. Cachar Cancer Hospital, Silchar 2. Assam Medical College, Dibrugarh 3. Dr. B. Borooah Cancer Institute, Guwahati 4. North East Cancer Hospital & Research Institute, Guwahati 5. Silchar Medical College and Hospital, Silchar 6. State Cancer Institute Guwahati 		

The State has three PBCRs' and six HBCRs'. The PBCRs' is situated in Cachar district (33 SoRs'), Dibrugarh district (42 SoRs') and Kamrup urban (81 SoRs')



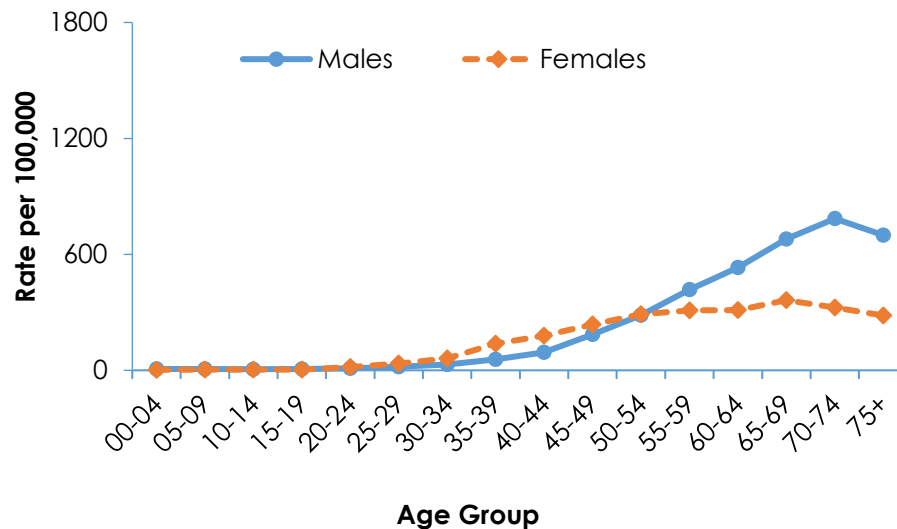
3.7 Number of cancer cases and Age Adjusted Incidence Rate (AAR) per 1,00,000 population

Gender	Cachar district		Dibrugarh district		Kamrup urban	
	Number of New Cancer Cases	AAR	Number of New Cancer Cases	AAR	Number of New Cancer Cases	AAR
Males	4663	129.0	2535	91.9	6223	213.0
Females	3943	104.8	2238	76.8	4790	169.6

The AAR is higher in males (129.0 per 100,000 males) than females (104.8 per 100,000 females) in Cachar district. Similarly, in Dibrugarh district, a higher AAR has been reported in males (91.9 per 100,000 males) in comparison to females (76.8 per 100,000 females). In Kamrup urban, the reported AAR is higher in males (213.0 per 100,000 males) than females (169.6 per 100,000 females).

3.8 Age Specific Incidence Rate (ASpR) per 100,000 population

3.8.1 Cachar district

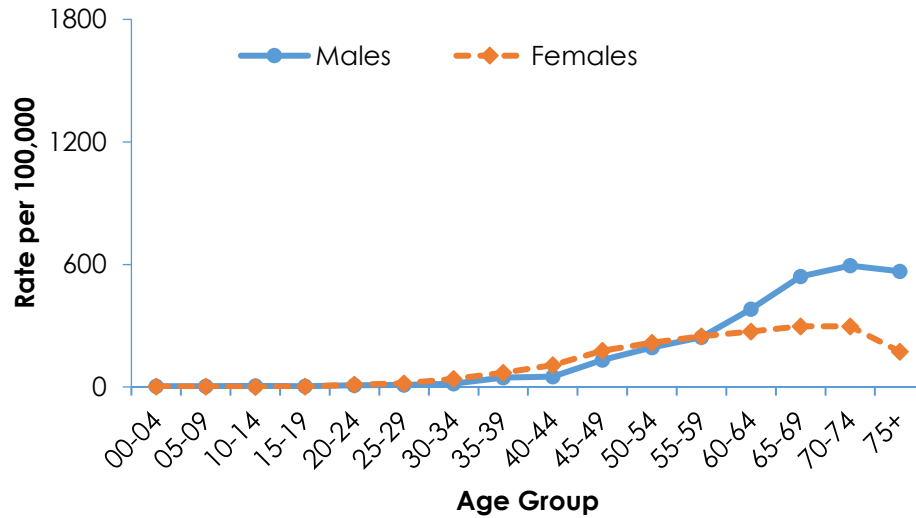


The Age-Specific Incidence Rates in both the genders shows a rise from 30-34 years age-group onwards. The highest Age-Specific Incidence Rate is seen in the 70-74 years age-group in males and 65-69 years age group in females



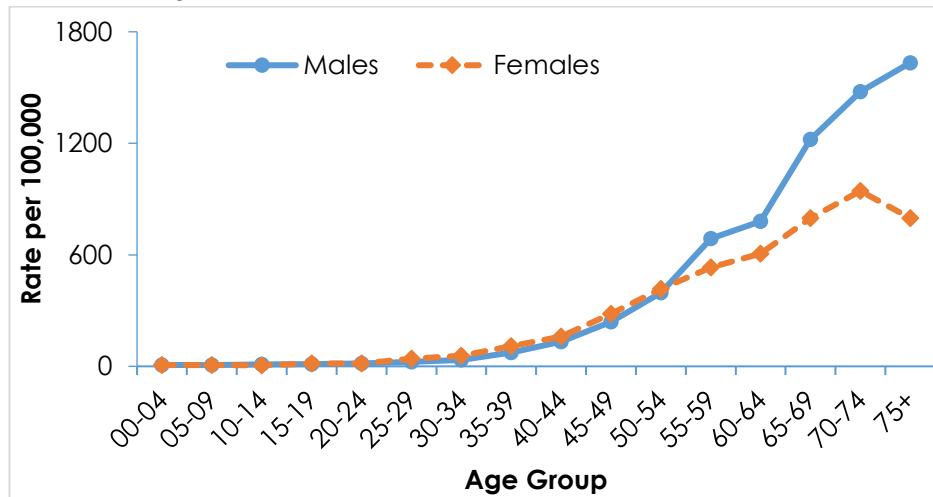


3.8.2 Dibrugarh district



The Age-Specific Incidence Rates in both the genders shows a rise from 30-34 years age-group onwards. The highest Age-Specific Incidence Rate is seen in the 70-74 years age-group in males and 65-69 years age group in females

3.8.3 Kamrup urban



The Age-Specific Incidence Rates in both the genders shows a rise from 30-34 years age-group onwards. The highest Age-Specific Incidence Rate is seen in the 75 plus age-group in males and 70-74 years age group in females

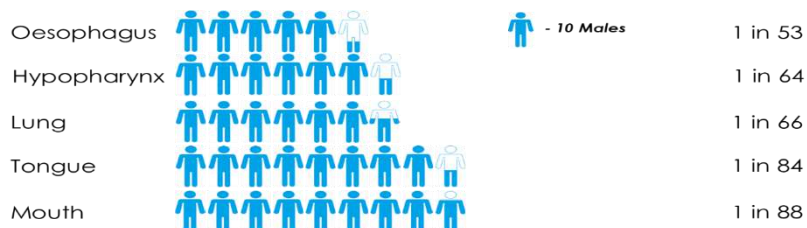




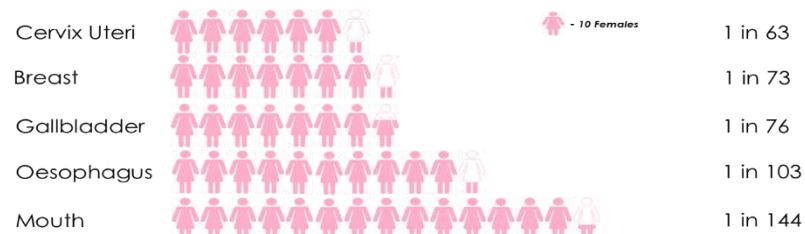
3.9 Probability of One in number of Persons developing cancer in 0-74 years age

3.9.1 Cachar district

Males



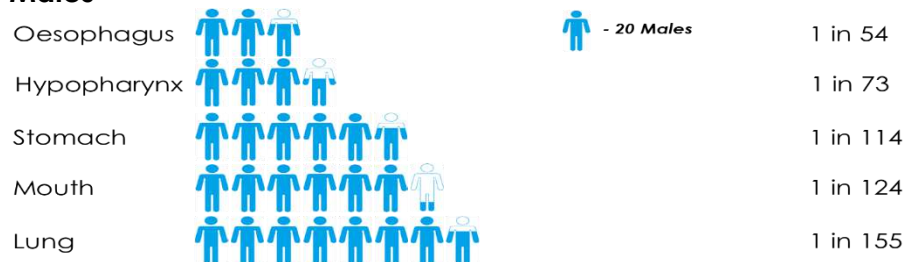
Females



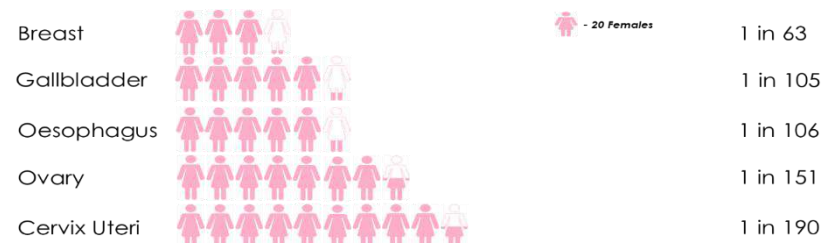
In Cachar district, the probability of developing oesophageal cancer is the highest in males (1 in every 53 males) followed by cancer of hypopharynx (1 in every 64 males). In females, the probability of developing cancer of cervix uteri is highest (1 in every 63 females) followed by breast cancer (1 in every 73 females).

3.9.2 Dibrugarh district

Males



Females



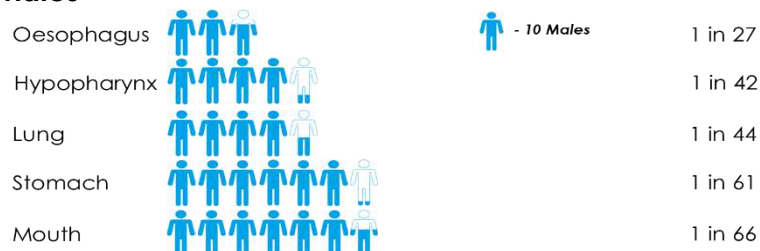
In Dibrugarh district, the probability of developing oesophageal cancer is the highest in males (1 in every 54 males), followed by hypopharynx cancer (1 in every 73 males). In females, the probability of developing breast cancer is the most (1 in every 63 females) followed by gallbladder cancer (1 in every 105 females).



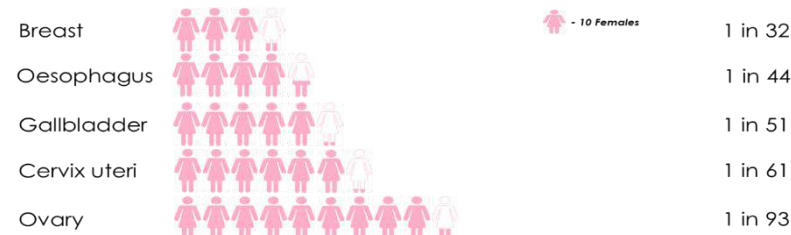


3.9.3 Kamrup urban

Males



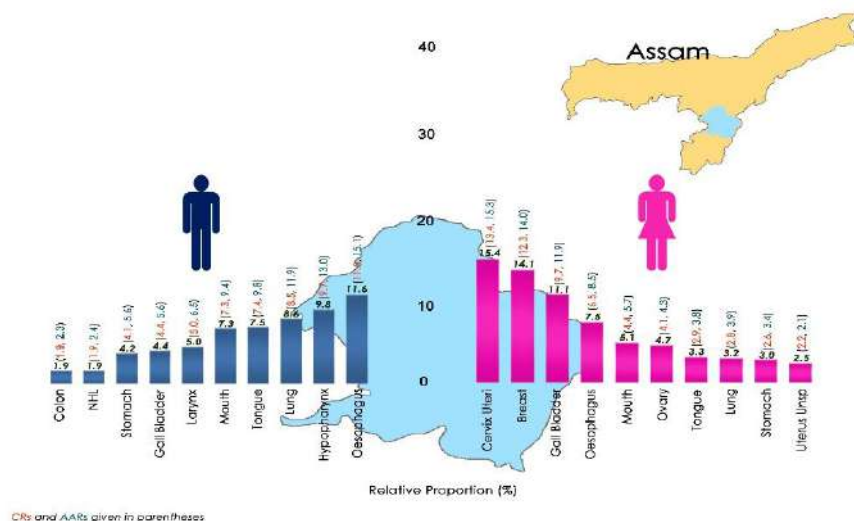
Females



In Kamrup urban, the probability of developing oesophageal cancer is the highest in males (1 in every 27 males), followed by hypopharynx (1 in every 42 males). In females, the probability of developing breast cancer is highest (1 in every 32 females) followed by oesophageal cancer (1 in every 44 females).

3.10 Leading Anatomical Sites of Cancer

3.10.1 Cachar district

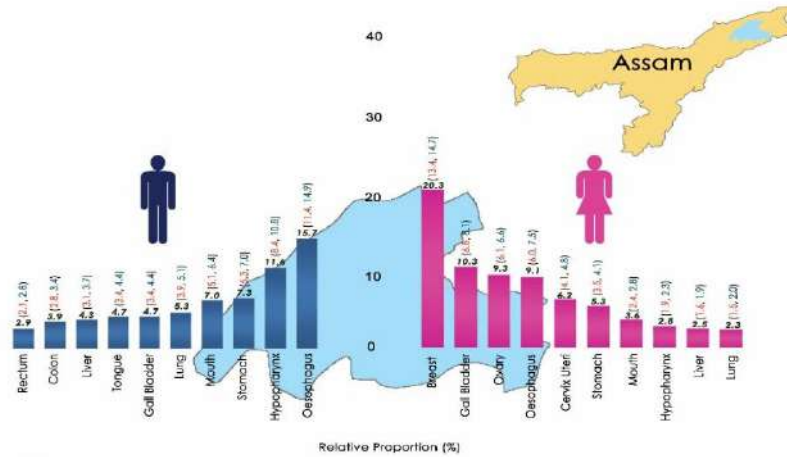


In Cachar district, among males, the proportion of oesophageal cancer (11.6%) is the highest, followed by the hypopharynx (9.8%) and lung cancer of (8.6%). In females, the cervix uteri is the leading cancer site (15.4%) followed by breast (14.1%) and Gall bladder (11.1%).



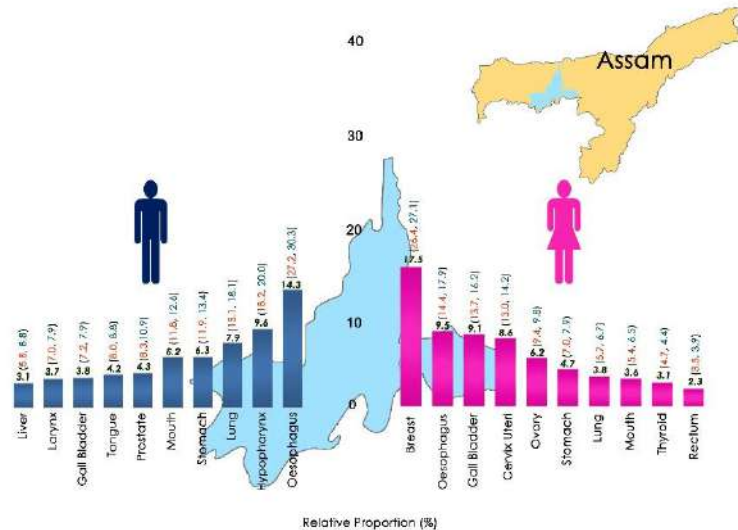


3.10.2 Dibrugarh district



CRs and AARs given in parentheses

3.10.3 Kamrup urban



CRs and AARs given in parentheses

In Dibrugarh district, among males, the proportion of oesophageal cancer (15.7%) is the highest, followed by the hypopharynx (11.6%) and stomach cancer (7.3%). In females, the breast is a leading cancer site (20.3%) followed by gall bladder (10.3%) and ovary (9.3%).

In Kamrup urban, among males, the proportion of oesophageal cancer (14.3%) is the highest, followed by the hypopharynx (9.6%) and lung cancer (7.9%). In females, the breast is a leading cancer site (17.5%) followed by oesophagus (9.5%) and gall bladder (9.1%).

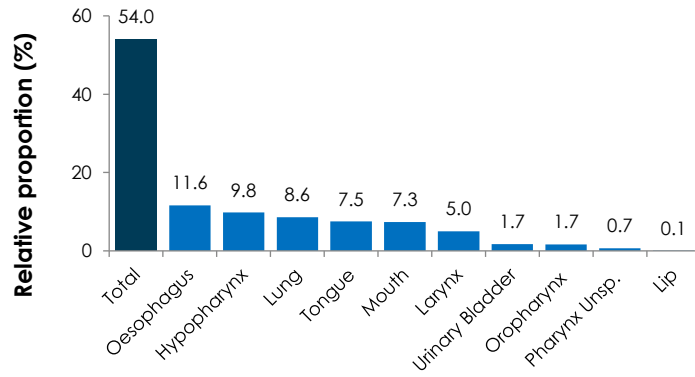




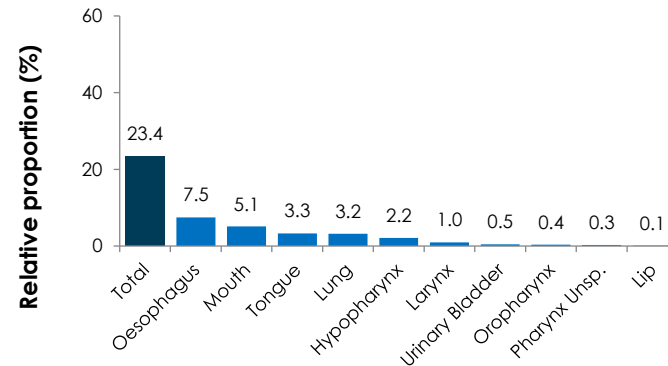
3.11 Relative Proportion (%) of Cancer Sites Associated with the Use of Tobacco

3.11.1 Cachar district

Males



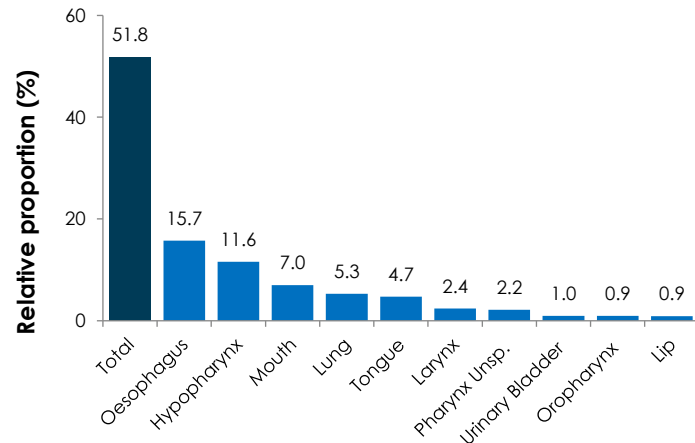
Females



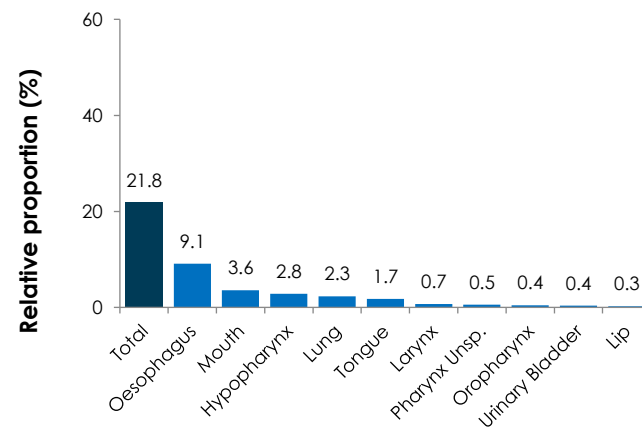
In Cachar district, over a half (54.0%) of cancers in males and close to one-fourth (23.4%) in females are tobacco use related cancer sites. Among these, oesophagus (11.6% in males; 7.5% in females) constitute the leading cancer site.

3.11.2 Dibrugarh district

Males



Females



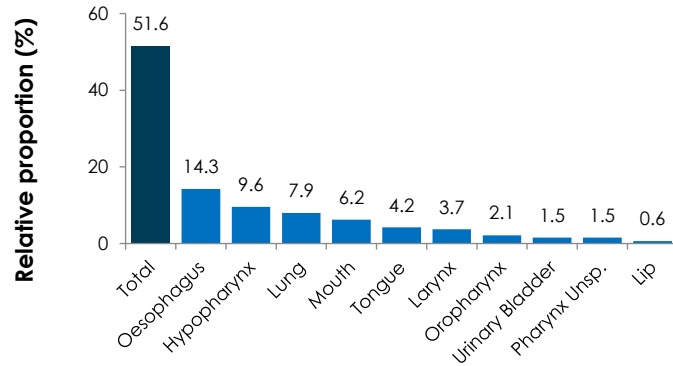
In Dibrugarh, over a half (51.8%) of cancers in males and close to one-fifth (21.8%) in females are tobacco use related cancer sites. Among these, oesophagus (15.7% in males; 9.1% in females) is the leading cancer site.



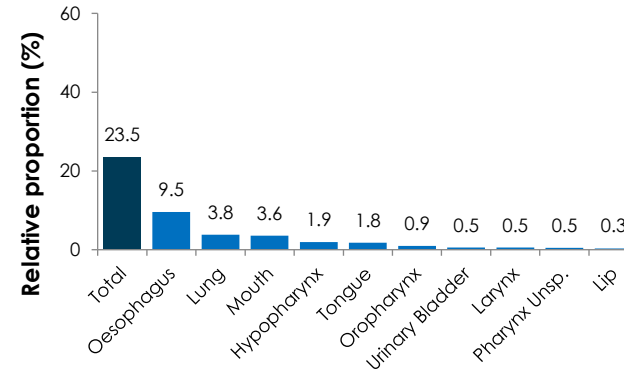


3.11.3 Kamrup urban

Males



Females



In Kamrup Urban, half (51.6%) of cancers in males and close to one-fourth (23.5%) in females are tobacco use related cancer sites. Among these, oesophagus (14.3% in males; 9.5% in females) is the leading cancer site.

3.12 Distribution of cancers according to ethnicity

3.12.1 Cachar district

Name of Ethnic Group	Number	%
Kayastha	1323	15.4
Meitei	344	4.0
Brahmin	285	3.3
Koibarta	248	2.9
Jogi	235	2.7
Bishnupriya	126	1.5
Others	4758	55.3

Total may not be 100%, because unspecified/unknown ethnic group cases are excluded.



**3.12.2 Dibrugarh district**

Name of Ethnic Group	Number	%
Ahom	1363	28.6
Tea-tribe	734	15.4
Kachari	363	7.6
Koibarta	160	3.4
Kalita	142	3.0
Nepalese	133	2.8
Brahmin	126	2.6
Kayastha	99	2.1
Muttock	67	1.4
Chutia	57	1.2
Others	1070	22.4

Total may not be 100%, because unspecified/unknown ethnic group cases are excluded.

3.12.3 Kamrup urban

Name of Ethnic Group	Number	%
Kalita	1381	12.5
Brahmin	805	7.3
Koibarta	609	5.5
Kayastha	478	4.3
Koch	345	3.1
Ahom	339	3.1
Boro	309	2.8
Bhutias	212	1.9
Nepalese	211	1.9
Koet	207	1.9
Marwari	191	1.7
Jogi	160	1.5
Chamars	136	1.2
Raj Bangshi	134	1.2
Others	3054	27.7

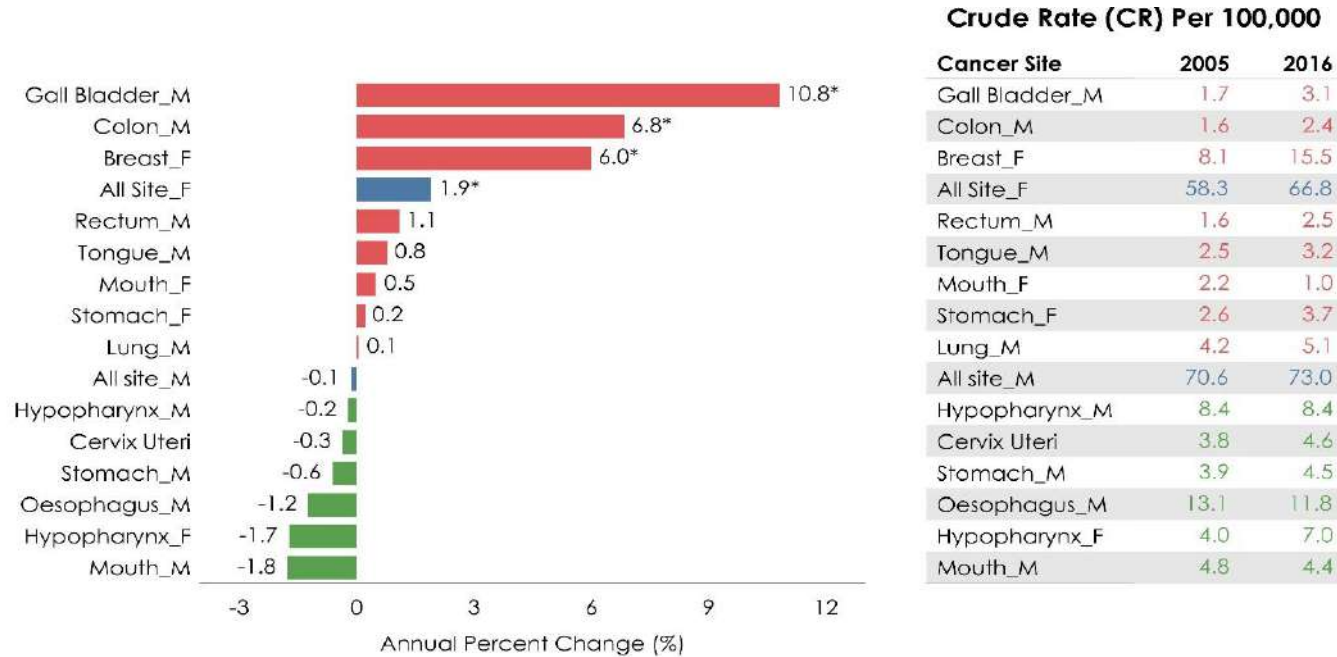
Total may not be 100%, because unspecified/unknown ethnic group cases are excluded.

The ethnic groups in which cancers are frequently encountered comprise of Kayastha (15.4%) in Cachar district, Ahom (28.6%) in Dibrugarh district and Kalita (12.5%) in Kamrup urban.



3.13 Trends over time in cancer incidence

3.13.1 Dibrugarh district



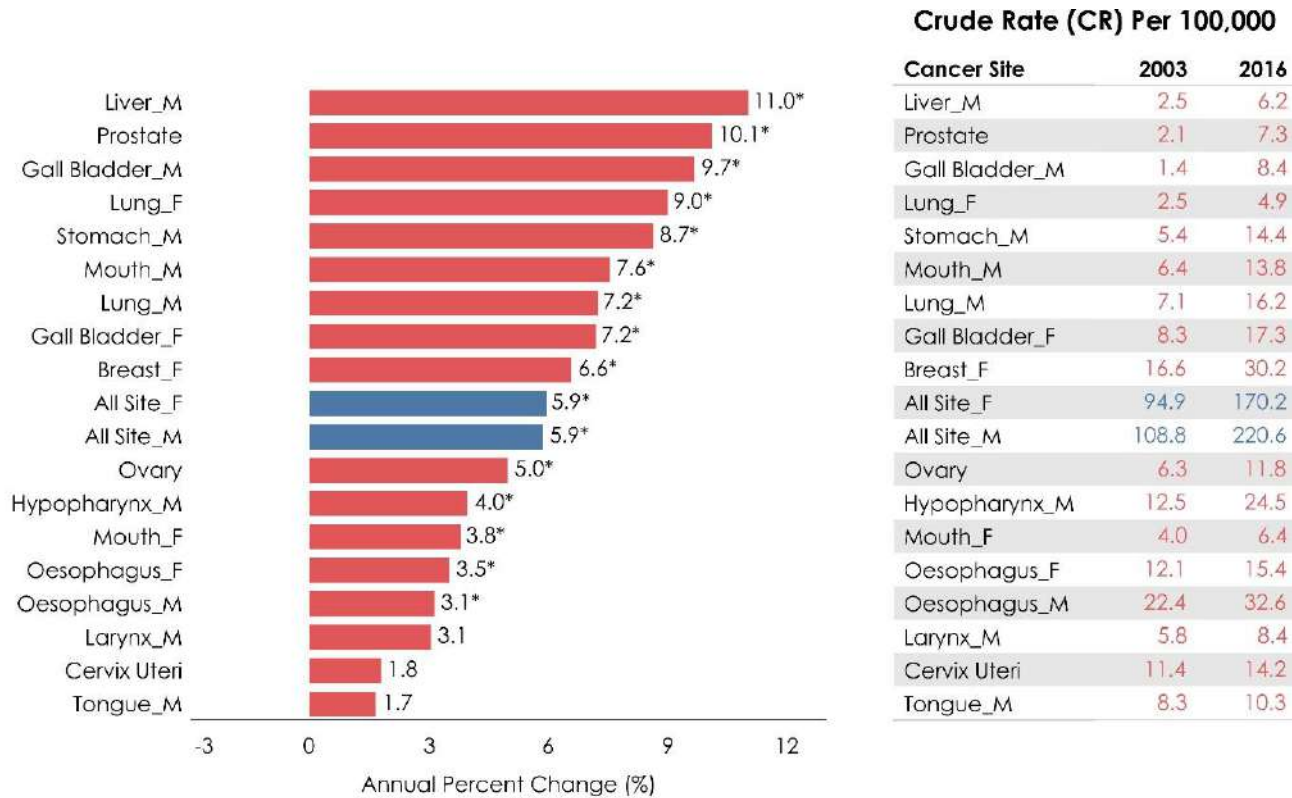
Increase in APC, Decrease in APC, Increase or Decrease in APC for All Sites; * Significant Increase or Decrease at 95% Confidence Level

In Dibrugarh district, the annual percent change (APC) in cancer incidence for all cancer sites is 1.9% (statistically significant) in females and –0.1% in males, from 2005 to 2016. In females, breast, mouth, and stomach cancer showed an increasing trend, whereas cancer of the cervix-uteri and hypopharynx showed a decline. In males, cancer of gallbladder, colon, rectum, tongue and lung display an increasing trend; whereas cancer stomach, oesophagus, mouth and hypopharynx show a decline. The APC for gallbladder cancer (10.8%) and colon cancer (6.8%) in males, and the APC for breast cancer (6.0%) in females are statistically significant.





3.13.2 Kamrup urban



Increase in APC, Decrease in APC, Increase or Decrease in APC for All Sites; * Significant Increase or Decrease at 95% Confidence Level

In Kamrup urban, the annual percent change (APC) in cancer incidence for all cancer sites is 5.9% in males and females, from 2003 to 2016, which also was statistically significant. In males, the APC increase for cancer of liver, prostate, gallbladder, stomach, mouth, lung, hypopharynx and oesophagus is significant. In females, APC increases are significant for cancer of the lung, gallbladder, breast, mouth, ovary, and oesophagus.





3.14 Case-Fatality Ratio:

3.14.1 Cachar district

Case Fatality Ratio (CFR)			
Cachar district	Incident cancer cases	Deaths	CFR%
Males	4663	895	19.2
Females	3943	617	15.6
Total	8606	1512	17.6

The total case fatality ratio is 17.6 % in Cachar district; it is reported to be slightly higher in males (19.2%) than females (15.6%).

3.14.2 Dibrugarh district

Case Fatality Ratio (CFR)			
Dibrugarh district	Incident cancer cases	Deaths	CFR%
Males	2535	669	26.4
Females	2238	396	17.7
Total	4773	1065	22.3

The total case fatality ratio is 22.3% in Dibrugarh district, higher in males (26.4%) than females (17.7%).

3.14.3 Kamrup urban

Case Fatality Ratio (CFR)			
Kamrup Urban	Incident cancer cases	Deaths	CFR%
Males	6223	1913	30.7
Females	4790	1002	20.9
Total	11013	2915	26.5

The total case-fatality ratio is 26.5% in Kamrup urban, higher in males (30.7%) than females (20.9%).



Key Observations

- Cancer ranks among the top five leading causes of death.
- Cancer of the oesophagus ranks as the first leading site in males and among the top five leading site in females.
- Cancer of the gall bladder is among the top three leading sites in females.
- The trend of cancer in all sites in both genders is rising in Kamrup urban.
- In Dibrugarh, the incidence is growing in females and declining in males.
- About half of the population currently use tobacco and alcohol consumption is reported in a quarter of males.
- About one third of the households in rural areas use clean fuel for cooking.
- The cause is medically certified in only one-tenth of the deaths.



MANIPUR



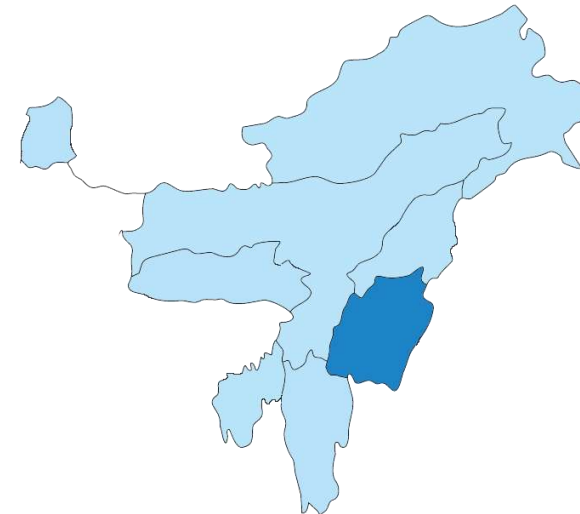


Chapter 4: Cancer and health status profile of Manipur

A. Health Status Profile

4.1 Socio-demographic profile [1]

Population (Total)	2855794
Number of males	1438586
Number of females	1417208
Sex Ratio	985
Major ethnic groups	Meitei, Kuki, Tangkhu
Literacy rate (%)	
Total	76.9
Males	83.6
Females	70.3



The total population of the region is 2855794, with a sex ratio of 985. The total literacy rate is 76.9%, being 83.6% in males and 70.3% in females. The major ethnic groups include Meitei, Kuki and Tangkhu.



4.2. NCD related Risk factor profile

Behavioural and lifestyle-related							
Tobacco use ^[2]							
Current tobacco use-smoked and/or smokeless (age 15 years and above) (%)							
Total						55.1	
Males						62.5	
Females						47.8	
Current smoked tobacco users (age 15 years and above) (%)							
Total						20.9	
Males						35.9	
Females						6.0	
Current smokeless tobacco users (age 15 years and above) (%)							
Total						47.7	
Males						50.2	
Females						45.2	
Alcohol consumption							
	Urban		Rural		Total		
	Men	Women	Men	Women	Men	Women	
age 15 years and above (%) ^[13]	34.6	1.0	39.2	0.8	37.5	0.9	
Metabolic risk factors ^[13]							
Overweight/Obese BMI >25kg/m ² (age 15-49 years) (%)	33.4	39.0	27.9	31.0	30.3	34.1	
Raised blood pressure age 15 years and above (%)	37.5	26.0	30.4	21.1	33.2	23.0	
Raised blood glucose (random) age 15 years and above (%)	19.2	16.0	14.7	12.1	16.5	13.6	
Air Pollution, DALYs per 100,000 ^[3]	2492.3						

The prevalence of current tobacco use is 55.1 %, higher for the smokeless form (47.7%) than the smoked form (20.9%). The DALYs' due to air pollution is reported to be 2492.3 per 100,000. Over one-third, (37.5%) of males over the age of 15 years consumed alcohol, while the proportion of alcohol use in females was negligible. Over one-third of the women in the age group of 15-49 years are obese (34.1%), which is slightly higher than the prevalence in males (30.3%). A higher proportion of males (33.2%) above 15 years of age have raised blood pressure than females (23.0%). The prevalence of raised blood glucose (random) is 13.6% in women and 16.5% in males.



4.3 Mortality related statistics

Life expectancy (2016) ^[5]	
Males	68.0 years
Females	72.8 years
Leading causes of death ^[6]	
Major Cause Group	Percentage
Circulatory System	23.5
Symptoms, Signs & Abnormal Findings	15.4
Respiratory System	9.7
Certain Infectious & Parasitic Diseases	9.0
Endocrine, Nutritional and Metabolic diseases	7.2
Status of Medical certification of cause of death ^[6]	
Percentage of Medically Certified Deaths to Total Registered Deaths (%)	51.4
Medical Institutions covered under MCCD	38
Medical Institutions Reported MCCD Data as per the National List	16
Ranking of States/UTs in the medical certification of cause of death 2018	10

The life expectancy is marginally higher in females (72.8 years) than males (68.0 years). Circulatory system causes comprise the leading cause of death (23.5%). The percentage of medically certified deaths to total registered deaths is 51.4%. The state ranks tenth in the medical certification of cause of death.



4.4 Health seeking behaviour and health practices [13]

	Urban	Rural	Total
History of cancer screening			
Women age 30-49 ever undergone a breast examination for breast cancer (%)	2.2	1.1	1.6
Women age 30-49 ever undergone an oral cavity examination for oral Cancer (%)	2.0	0.3	1.0
Women age 30-49 ever undergone screening for cervical Cancer (%)	2.5	1.9	2.1
Men age 30-49 ever undergone an oral cavity examination for oral Cancer (%)	1.1	0.6	0.8
Immunization history			
Children age 12-23 months who have received 3 doses of penta or hepatitis B vaccine (%)	87.5	76.5	80.0
Household profile			
Population living in households that use an improved sanitation facility (%)	60.6	67.5	64.9
Households using clean fuel for cooking (%)	86.4	60.7	70.4
Households with any usual member covered under a health insurance/financing scheme (%)	12.3	15.3	14.2

The proportion of women who have undergone screening is 1.6% for breast cancer, 1.0% for oral cancer and 2.1% for cervical cancer. Only 0.8 % of men had a history of screening for oral cancer. As many as 80.0 % of children in 12-23 months had received immunization with Penta and hepatitis B vaccine. About 64.9% of the population is living in households that use an improved sanitation facility—over two-thirds (70.4%) of the population are using clean fuel for cooking. The coverage with a health insurance scheme or financing scheme is low at a figure of 14.2%.



4.5 Status of the health system

A. Public sector health facilities ^{[7],[8]}	Number
Sub Centres (SC)	429
Health and Wellness centre - Sub centre (SC-HWC)	61
Primary Health Centres (PHC)	94
Health and Wellness Centre - Primary Health Centre (PHC-HWC)	05
Community Health Centres (CHC)	23
Sub-district Hospitals (SDH)	01
District Hospitals (DH)	09
Number of government allopathic doctors and dental surgeons	389
B. Tertiary health care facilities	
Medical Colleges ^[9]	02
State cancer institute ^[10]	00
Tertiary cancer care centre ^[10]	00
Regional cancer care centre ^[11]	01
C. State government health scheme ^[15]	Chief Minister-gi Hakshelgi Tengbang (CMHT)

The state has 429 SCs', 61SC HWCs', 94 PHCs', 05 PHC HWCs', 23 CHCs', 01 sub-district and 09 district hospitals. There are two medical colleges and one Regional Cancer Centre. The state has a government health scheme known as Chief Minister-gi Hakshelgi Tengbang (CMHT).



B. Profile of Cancer

4.6 Details of Cancer Registries in the State

Population Based Cancer Registry	
Location	Regional Institute of Medical Sciences, Imphal
Established Year	2003
Coverage Area	Imphal west district from 2003 upto 2004; Manipur state coverage from 2005.
Sources of registration	17
Area (in Sq.km)	22327
Urban & Rural (%)	29.2 & 70.8
Hospital Based Cancer Registries: 1. Regional Institute of Medical Sciences, Imphal 2. Jawaharlal Nehru Institute of Medical Science, Imphal	

The State has one PBCR and two HBCRs'. The PBCR is located in Regional Institute of Medical Sciences, Imphal and has 17 sources of registration.

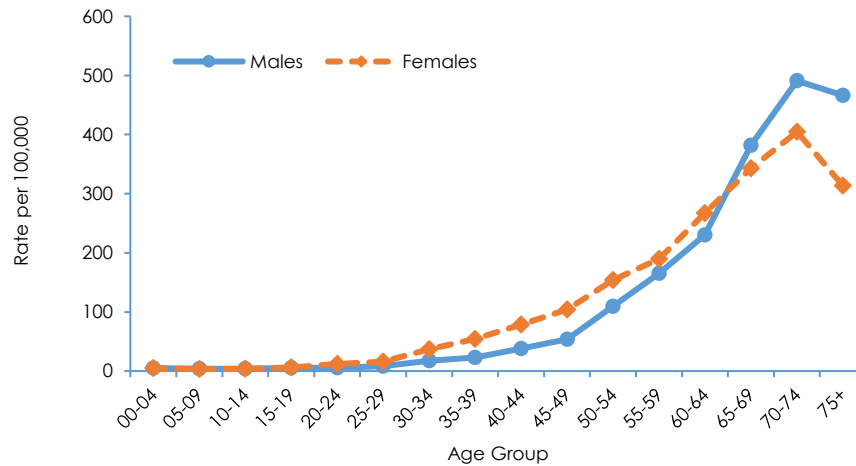
4.7 Number of cancer cases and Age-Adjusted Incidence Rate (AAR) per 1,00,000 population

Gender	Number of New Cancer Cases	AAR
Males	3702	62.8
Females	4500	71.1

The AAR is higher in females (71.1 per 100,000 females) than males (62.8 per 100,000 males)



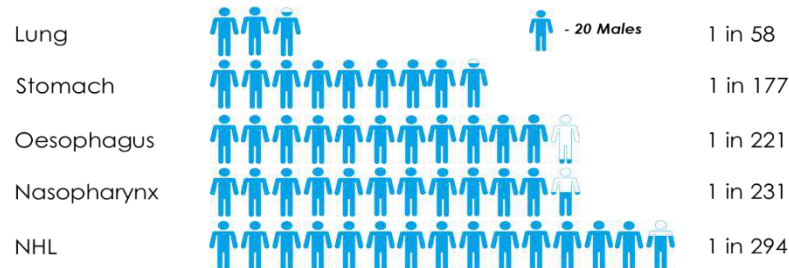
4.8 Age Specific Incidence Rate (ASpR)



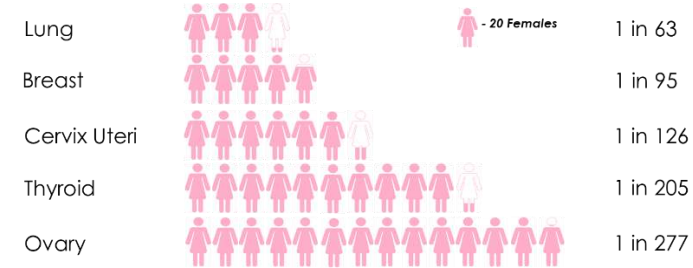
The Age-Specific Incidence Rates in both the genders shows a rise from 30-34 years age-group onwards. The highest Age-Specific Incidence Rate is seen in the 70-74 years age-group in males and females.

4.9 Probability of One in number of Persons developing cancer in 0-74 years age

Males



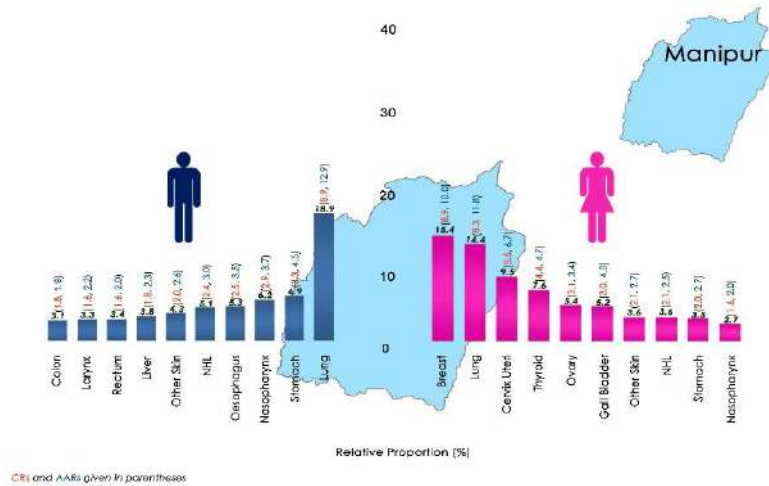
Females



The probability of developing lung cancer is highest in both the genders (1 in every 58 males and 1 in every 63 females), followed by stomach cancer in males (1 in every 177 males) and breast cancer in females (1 in every 95 females).



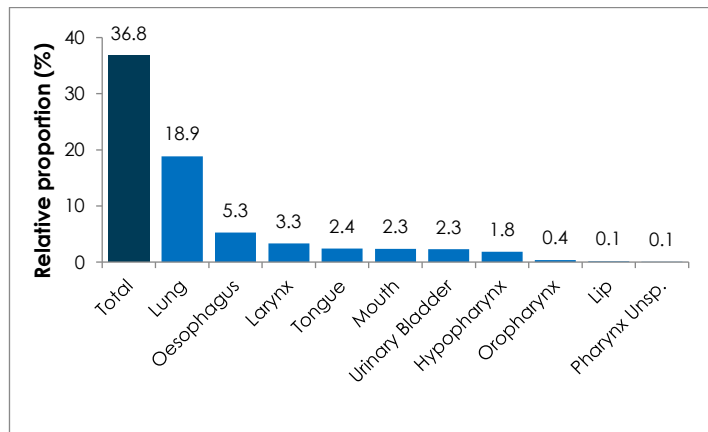
4.10 Leading Anatomical Sites of Cancer



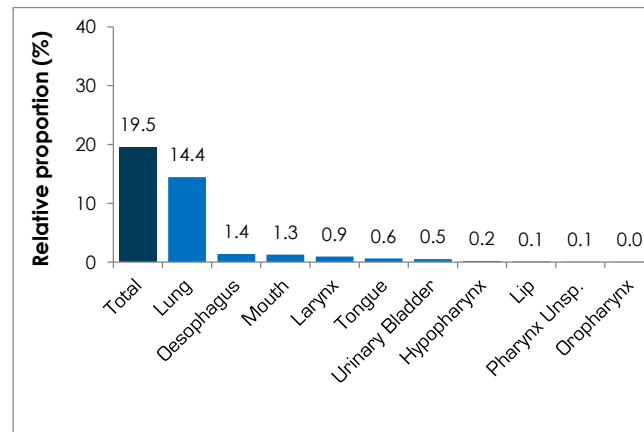
Among males, the proportion of lung cancer (18.9%) is the most, followed by stomach cancer (6.9%) and cancer of the nasopharynx (6.2%). In females, the breast is a leading cancer site (15.4%) followed by lung (14.4%) and cervix uteri (9.5%).

4.11 Relative Proportion (%) of Cancer Cases Associated with the Use of Tobacco

Males



Females



Over a third (36.8%) of cancers in males and close to one-fifth (19.5%) in females are tobacco use related cancer sites. Among these, lung (18.9 % in males; 14.4% in females) followed by oesophagus (5.3% in males; 1.4% in females) constitute the leading sites.





4.12 Distribution of cancers according to ethnicity

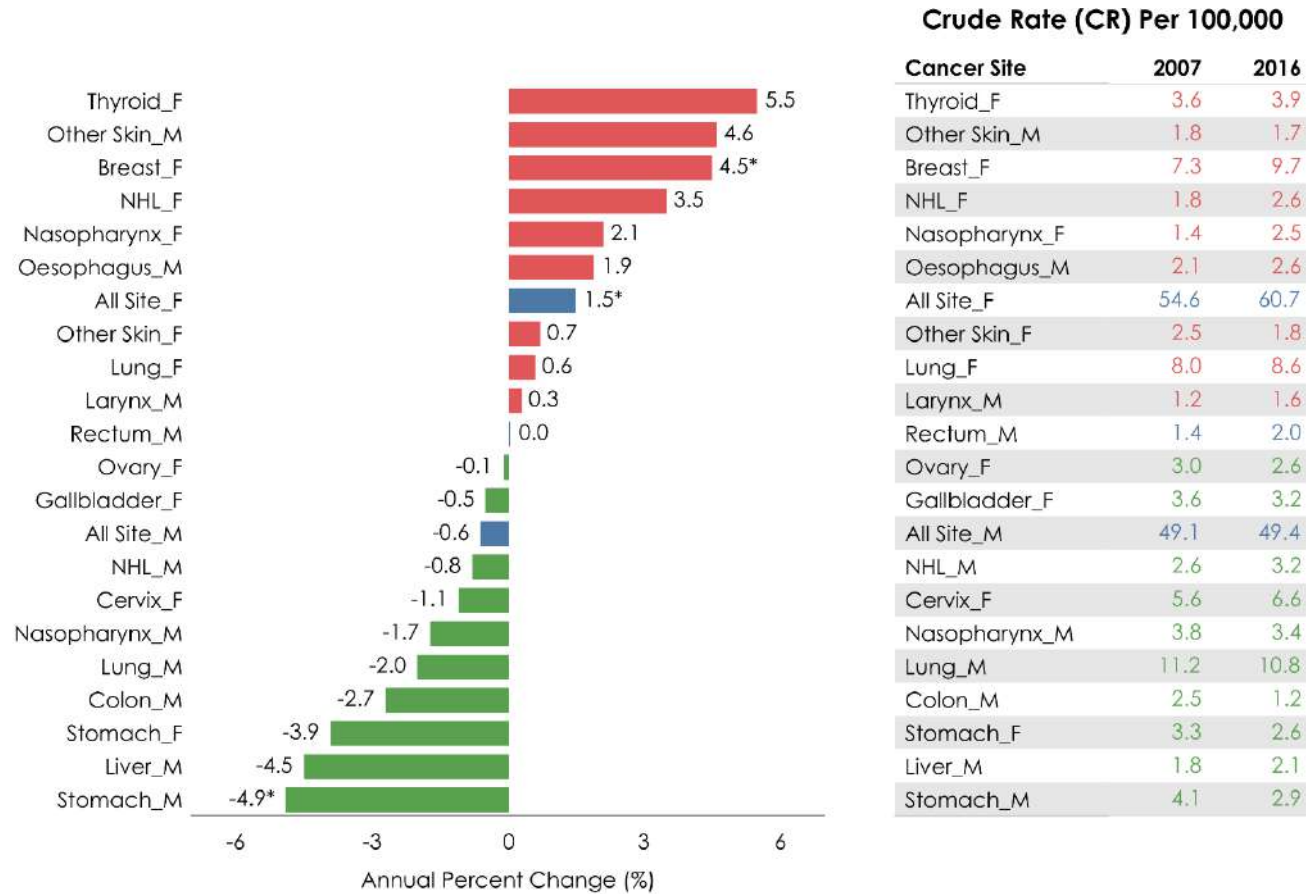
Name of Ethnic Group	Number	%
Meitei	4788	58.4
Kuki	711	8.7
Tangkhul	460	5.6
Rongmei	274	3.3
Paite	209	2.5
Hmar	170	2.1
Nepalese	140	1.7
Naga	126	1.5
Mao	96	1.2
Anal	81	1.0
Others	523	6.4

Total may not be 100%, because unspecified/unknown ethnic group cases are excluded.

Among all the ethnic groups, over half (58.4%) of cancer cases occur in the Meitei ethnic group.



4.13 Trends over time in cancer incidence



Increase in APC, Decrease in APC, Increase or Decrease in APC for All Sites; * Significant Increase or Decrease at 95% Confidence Level

There is a significant increase in annual percent change for cancer in all sites among females (APC=1.5), while for males-a significant decline has been witnessed the APC (-0.6). The rise in breast cancer incidence (APC=4.5) is observed in females, while among males, there has been a significant decrease in stomach cancer APC (-4.9).





4.14 Case-Fatality Ratio:

Case Fatality Ratio (CFR)			
Manipur state	Incident cancer cases	Deaths	CFR%
Males	3702	1155	31.2
Females	4500	1008	22.4
Total	8202	2163	26.4

The total case fatality ratio is 26.4%, higher in males (31.2%) than females (22.4%).

Key Observations

- The cancer incidence rate and rise are higher for females than males.
- The incidence of cancers of the thyroid, breast and lung are showing an increasing trend in females.
- The lung is the first leading cancer site in males and second-leading site in females.
- Among males, about two-third are current tobacco users, while 35.9% are current smokers; one third are overweight/obese and hypertensive.
- Nearly half of the females are current tobacco users, while overweight and obesity are prevalent in about one-third of the female population.
- The cause in half of the deaths is medically certified.
- One-tenth of the population is covered under an insurance scheme.



MEGHALAYA



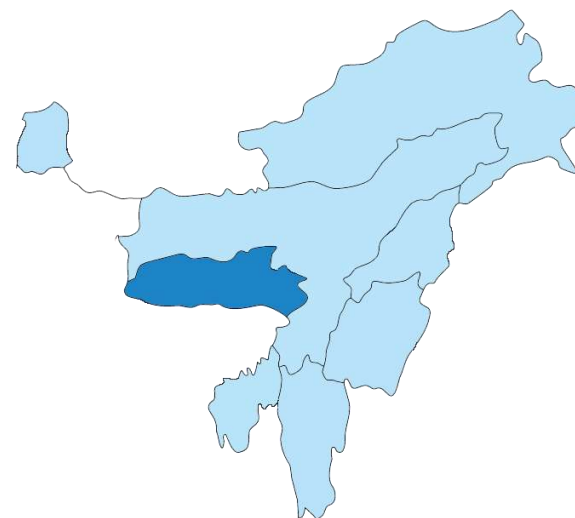


Chapter 5: Cancer and health status profile of Meghalaya

A. Health Status Profile

5.1 Socio-demographic profile [1]

Population (Total)	2966889
Number of males	1491832
Number of females	1475057
Sex Ratio	989
Major ethnic groups	Khasi (Jaintia) and Garo
Literacy rate (%)	
Total	74.4
Males	76.0
Females	72.9



The total population of the region is 2966889, with a sex ratio of 989. The total literacy rate is 74.4%, being 76.0% in males and 72.9% in females. The major ethnic group is Khasi (Jaintia) and Garo.



5.2 NCD related Risk factor profile

Behavioral and lifestyle-related							
Tobacco use ^[2]							
Current tobacco use-smoked and/or smokeless (age 15 years and above) (%)							
Total						47.0	
Males						59.8	
Females						34.2	
Current smoked tobacco use (age 15 or above) (%)							
Total						31.6	
Males						53.7	
Females						9.5	
Current smokeless tobacco use (age 15 or above) (%)							
Total						20.3	
Males						11.6	
Females						29.1	
Alcohol consumption							
age 15 years or above (%) ^[13]	Urban		Rural		Total		
	Men	Women	Men	Women	Men	Women	
	28.5	1.0	33.5	1.6	32.4	1.5	
Metabolic risk factors ^[13]							
Overweight/Obese BMI >25 (age 15-49 years) (%)	30.2	17.9	10.6	9.7	13.9	11.5	
Raised blood pressure (age 15 years or above) (%)	28.5	24.6	19.9	17.1	21.4	18.7	
Raised random blood glucose (age 15 years or above) (%)	16.0	10.3	13.4	9.3	13.9	9.5	
Air Pollution, DALYs per 100,000 ^[3]	2059.25						

The prevalence of current tobacco use is 47.0%, higher for the smoked form (31.6%) than the smokeless form (20.3%). The DALYs' due to air pollution is reported to be 2059.25 per 100,000. Close to one-third, (32.4%) of males over the age of 15 years consumed alcohol, while the proportion of alcohol use in females was negligible. 13.9% of the men in the age group of 15-49 years are obese, slightly higher than female prevalence (11.5%). A higher proportion of males (21.4%) have raised blood pressure than females (18.7%). The prevalence of raised blood glucose is 9.5% in women and 13.9% in men.



5.3 Mortality related statistics

Life expectancy (2016) ^[5]	
Males	66.8 years
Females	72.4 years
Leading causes of death (MCCD 2018) ^[6]	
Major Cause Group	Percentage
Circulatory System	21.1
Respiratory System	10.0
Certain Infectious & Parasitic Diseases	11.2
Neoplasms	11.6
Certain Conditions originating in Perinatal Period	8.4
Status of Medical certification of cause of death ^[6]	
Percentage of Medically Certified Deaths to Total Registered Deaths (%)	43.1
Medical Institutions covered under MCCD	170
Medical Institutions Reported MCCD Data as per the National List	170
Ranking of States/UTs in the medical certification of cause of death 2018	12

The life expectancy is marginally higher in females (72.4 years) than males (66.8 years). Circulatory system related causes comprise the leading cause of death (21.1%). The percentage of medically certified deaths to total registered deaths is 43.1%. The state ranks twelfth in the medical certification of cause of death.



5.4 Health seeking behaviour and health practices [13]

	Urban	Rural	Total
History of cancer screening			
Women aged 30-49 ever undergone a breast examination for breast cancer (%)	1.3	0.2	0.5
Women aged 30-49 ever undergone an oral cavity examination for oral Cancer (%)	0.4	0.4	0.4
Women aged 30-49 ever undergone screening for cervical Cancer (%)	0.6	0.6	0.6
Men aged 30-49 ever undergone an oral cavity examination for oral Cancer (%)	2.3	0.9	1.2
Immunization history			
Children age 12-23 months who have received 3 doses of penta or hepatitis B vaccine (%)	56.0	67.3	65.7
Household profile			
Population living in households that use an improved sanitation facility (%)	81.3	83.3	82.9
Households using clean fuel for cooking (%)	76.7	21.7	33.7
Households with any usual member covered under a health insurance/financing scheme (%)	52.8	66.5	63.5

The proportion of women who have undergone screening is 0.5% for breast cancer, 0.4% for oral cancer and 0.6% for cervical cancer. Only 1.2% of men had a history of screening for oral cancer. As many as 65.7% of children in 12-23 months had received immunization with Penta and hepatitis B vaccine. About 82.9% of the population live in households that use an improved sanitation facility—only third (33.7%) of the population use clean fuel for cooking. The coverage with a health insurance scheme or financing scheme is 63.5%.



5.5 Status of the health system

A. Public sector health facilities ^{[7],[8]}	
Sub centres (SC)	445
Health and Wellness Centre - Sub Centre (HWC-SC)	32
Primary Health Centres (PHC)	110
Health and Wellness Centre - Primary Health Centre (HWC-PHC)	08
Community Health Centres (CHC)	28
Sub-district Hospitals (SDH)	00
District Hospitals (DH)	11
Number of government allopathic doctors and dental surgeons	386
B. Tertiary health care facilities	
Medical Colleges ^[9]	01
State cancer institute ^[10]	00
Tertiary cancer care centre ^[10]	00
Regional cancer care centre ^[11]	00
C. State government health scheme ^[14]	Megha Health Insurance Scheme (MHIS)

The state has 445 SCs, 32 HWC – SCs', 110 PHCs', 08 HWC– PHCs', 28 CHCs' and 11 DHs. There is only one medical college. The state implements government health scheme known as Megha Health Insurance Scheme (MHIS).



B. Profile of Cancer

5.6 Details of Cancer Registries in the State

Population Based Cancer Registry- Meghalaya	
Location	Civil Hospital, Shillong
Established Year	2010
Coverage Area	East Khasi Hills, West Khasi Hills, Ri Bhoi & Janitia Hills
Sources of Registration	22
Area (in Sq.km)	14262
Urban & Rural (%)	24.9 & 75.1
Hospital Based Cancer Registry	North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences, Shillong

The state has one PBCR situated at Civil Hospital Shillong, covering East Khasi Hills, West Khasi Hills, Ri Bhoi & Janitia Hills through 22 sources of registration for the period 2012-2016 and one HBCR at North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences, Shillong.

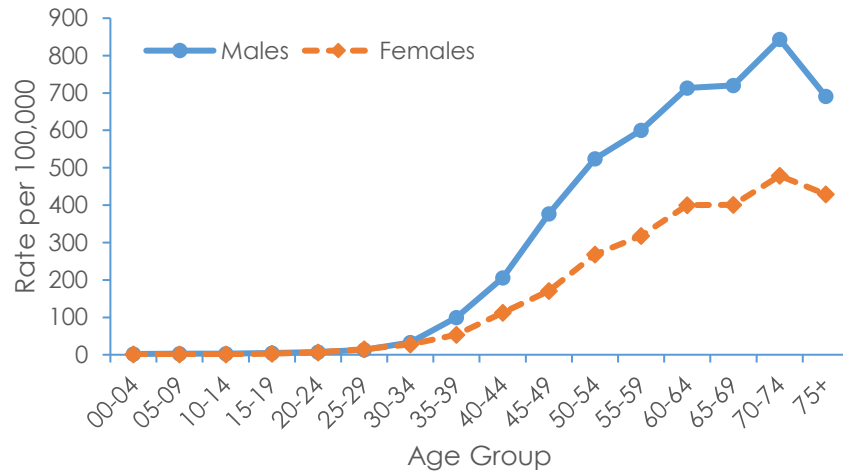
5.7 Number of cancer cases and Age Adjusted Incidence Rate (AAR) per 1,00,000 population

Gender	Number of New Cancer Cases	AAR
Males	4688	176.8
Females	2832	96.5

The AAR is higher in males (176.8 per 100,000 males) than females (96.5 per 100,000 females).



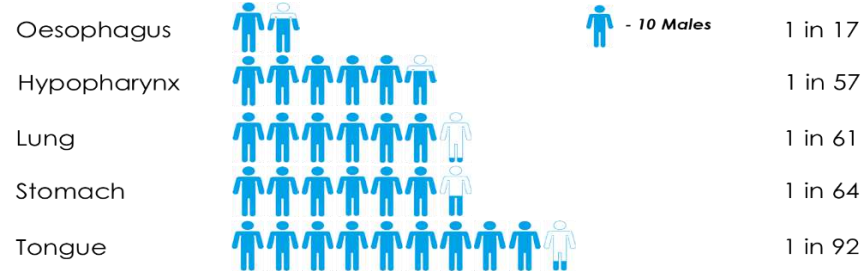
5.8 Age specific Incidence Rate (ASpR)



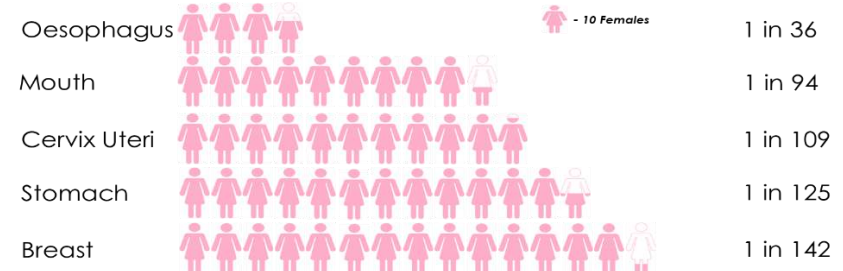
The Age-Specific Incidence Rates in both the genders show a rise from 30-34 years age-group onwards. In both, the genders, highest Age-Specific Incidence Rate is seen in the 70-74 years age-group.

5.9 Probability of One in number of Persons developing cancer in 0-74 years age

Males



Females

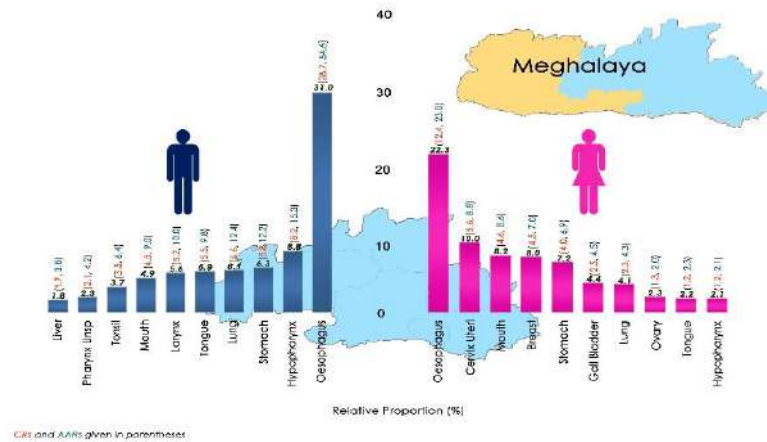


The probability of developing oesophageal cancer is highest in both genders (1 in every 17 males and 1 in every 36 females), followed by cancer of hypopharynx in males (1 in every 57 males) and mouth cancer in females (1 in every 94 females).





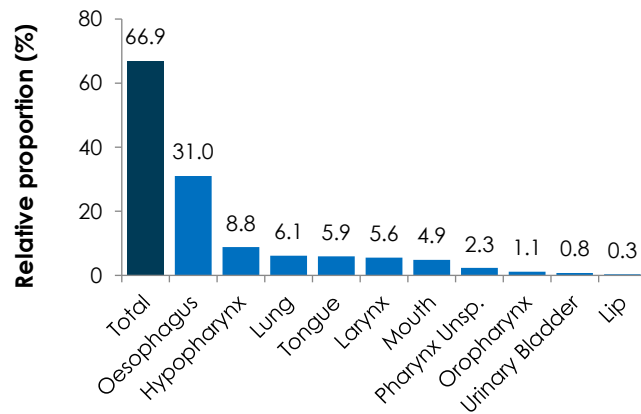
5.10 Leading Anatomical Sites of Cancer



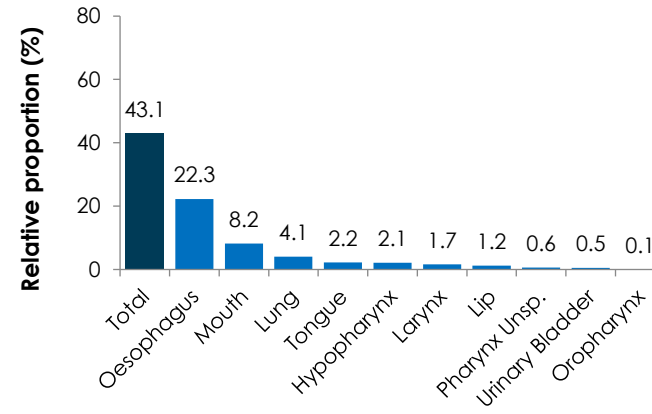
The proportion of oesophageal cancer is highest in both the genders (31.0% in males; 22.3% in females). In males, hypopharynx (8.8%) and stomach (6.3%) are the second and third leading cancer sites respectively, whereas, in females, cervix-uteri (10.0%) and mouth (8.2%) rank as second and third leading cancer sites

5.11 Relative Proportion (%) of Cancer sites Associated with the use of Tobacco

Males



Females



As many as two thirds (66.9%) of cancers in males and 43.1% in females are tobacco use related cancer sites. Oesophagus is the leading cancer site related to tobacco use in both the genders (31.0% in males and 22.3% in females).





5.12 Case-Fatality Ratio

Case Fatality Ratio (CFR)			
Meghalaya	Incident cancer cases	Deaths	CFR%
Males	4688	1848	39.4
Females	2832	1098	38.8
Total	7520	2946	39.2

The case fatality ratio (CFR) is almost similar in males (39.4%) and females (38.8%).

Key observations

- Cancer ranks among the top five leading causes of death in the state.
- Cancer of the oesophagus is the leading site of cancer in both genders.
- Current use of tobacco is reported in nearly half of the population, while about one-third of the males consume alcohol.
- Only one-third of households have access to clean fuel.
- The cause in less than half of the deaths is medically certified.
- The state has a scarcity of tertiary cancer care facilities.



MIZORAM



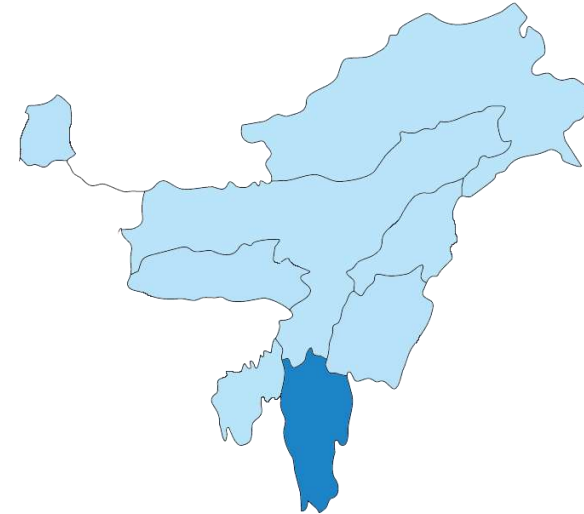


Chapter 6: Cancer and health status profile of Mizoram

A. Health Status Profile

6.1 Socio-demographic profile [1]

Population (Total)	1097206
Number of males	555339
Number of females	541867
Sex Ratio	976
Major ethnic groups	Mizo
Literacy rate (%)	
Total	91.3
Males	93.4
Females	89.3



The total population of the region is 1097206, with a sex ratio of 976. The total literacy rate is 91.3%, being 93.3% in males and 89.3% in females.



6.2 NCD related Risk factor profile

Behavioral and lifestyle-related							
Tobacco use ^[2]							
Current tobacco use-smoked and/or smokeless (age 15 years and above) (%)							
Total						58.7	
Males						64.9	
Females						52.4	
Current smoked tobacco use (age 15 or above) (%)							
Total						34.4	
Males						54.1	
Females						14.3	
Current smokeless tobacco use (age 15 or above) (%)							
Total						33.5	
Males						21.3	
Females						46.0	
Alcohol consumption							
	Urban		Rural		Total		
	Men	Women	Men	Women	Men	Women	
age 15 years or above (%) ^[13]	22.8	1.0	25.2	0.8	23.8	0.9	
Metabolic risk factors ^[13]							
Overweight/Obese BMI >25 s (age 15-49 years) (%)	38.3	29.7	24.2	16.9	31.9	24.2	
Raised blood pressure age 15 years or above (%)	28.7	21.0	21.1	13.5	25.2	17.7	
Raised blood glucose (random) age 15 years or above (%)	16.4	15.0	14.3	12.3	15.4	13.8	
Air Pollution, DALYs per 100,000 ^[3]	2003.7						

The prevalence of current tobacco use is 58.7%, slightly higher for the smoked form (34.4%) than the smokeless form (33.5%). The DALYs' due to air pollution is reported to be 2003.7 per 100,000. 23.8% of males over the age of 15 years consumed alcohol, while the proportion of alcohol use in females was negligible. Close to one-third of the men (31.9%) in the age group of 15-49 years are obese, higher than female prevalence (24.2%). A higher proportion of males (25.2%) have raised blood pressure than females (17.7%). The prevalence of raised blood glucose is 13.8% in women and 15.4% in men.



6.3 Mortality related statistics

Life expectancy (2016) ^[5]	
Males	68.3
Females	73.8
Leading causes of death (MCCD 2018) ^[6]	
Major Cause Group	Percentage
Diseases of the circulatory system	16.0
Certain infections and parasitic infestations	15.3
Diseases of the respiratory system	13.2
Neoplasms	12.5
Certain conditions originating in the perinatal period	5.3
Status of Medical certification of cause of death ^[6]	
Percentage of Medically Certified Deaths to Total Registered Deaths (%)	58.9
Medical Institutions covered under MCCD	--
Medical Institutions Reported MCCD Data as per the National List	108
Ranking of States/UTs in the medical certification of cause of death 2018	8

The life expectancy is marginally higher in females (73.8 years) than males (68.3 years). Diseases of the circulatory system account for 16.0% of the deaths the percentage of medically certified deaths to total registered deaths is 58.9%. The state ranks eighth in the medical certification of cause of death.



6.4 Health seeking behavior and health practices ^[13]

	Urban	Rural	Total
History of cancer screening			
Women aged 30-49 ever undergone a breast examination for breast cancer (%)	3.6	1.3	2.7
Women aged 30-49 ever undergone an oral cavity examination for oral Cancer (%)	1.4	0.3	0.9
Women aged 30-49 ever undergone screening for cervical cancer (%)	9.4	3.3	6.9
Men aged 30-49 ever undergone an oral cavity examination for oral Cancer (%)	0.2	2.4	1.2
Immunization history			
Children aged 12-23 months who have received 3 doses of penta or hepatitis B vaccine (%)	74.6	78.1	76.4
Household profile			
Population living in households that use an improved sanitation facility (%)	97.1	93.2	95.3
Households using clean fuel for cooking (%)	97.9	66.4	83.8
Households with any usual member covered under a health insurance/financing scheme (%)	41.2	52.8	46.4

The proportion of women who have undergone screening is 2.7% for breast cancer, 0.9 % for oral cancer and 6.9% for cervical cancer. Only 1.2% of men had a history of screening for oral cancer. As many as 76.4% of children in 12 to 23 months had received immunization with Penta and hepatitis B vaccine. About 95.3% of the population lives in households that use an improved sanitation facility, 83.0% of the population are using clean fuel for cooking. The coverage with a health insurance scheme or financing scheme is low at a figure of 46.4%.



6.5 Status of the health system

A. Public sector health facilities ^{[7],[8]}	Number
Sub centres (SC)	370
Primary Health Centres (PHC)	65
Health and Wellness Centre - Primary Health Centre (HWC-PHC)	04
Community Health Centres (CHC)	9
Sub-District Hospitals (SDH)	02
District Hospitals (DH)	09
Number of government allopathic doctors and dental surgeons	138
B. Tertiary health care facilities	
Medical Colleges ^[9]	01
State cancer institute ^[10]	00
Tertiary cancer care centre ^[10]	01
Regional cancer care centre ^[11]	01
C. State government health scheme ^[17]	Mizoram State Health Care Scheme (MSHCS)

The state has 370 SCs, 65 PHCs', 04 HWC – PHCs', 09 CHCs', 02 SDHs and 09 DHs. There is only one medical college, one Tertiary Cancer Care Center and Regional Cancer Centre. The state implements health scheme known as Mizoram State Health Care Scheme (MSHCS).



B. Profile of Cancer

6.6 Details of Cancer Registries in the State

Population Based Cancer Registry	
Location	Civil Hospital, Aizawl
Established Year	2003
Coverage Area	Mizoram state
Sources of registration	37
Area (in Sq.km)	21087
Urban & Rural (%)	52.1 & 47.9
Hospital Based Cancer Registries : 1. Mizoram State Cancer Institute (Civil Hospital), Aizawl 2. Zoram Medical College, Aizawl	

The Population Based Cancer Registry is located at Civil Hospital, Aizawl and covers the entire state through 37 sources of registration.

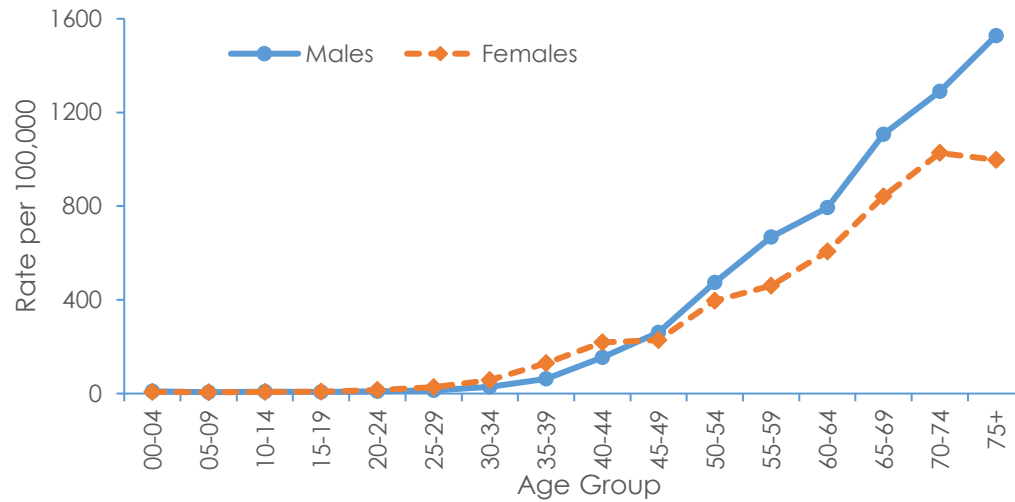
6.7 Number of cancer cases and Age Adjusted Incidence Rate (AAR) per 100,000 population

Gender	Mizoram state		Aizawl District	
	Number of New Cancer Cases	AAR	Number of New Cancer Cases	AAR
Males	4323	207.0	2180	269.4
Females	3736	172.3	1900	214.1

In Mizoram state, the AAR is higher in males (207.0 per 100,000 males) than females (172.3 per 100,000 females). Similarly, in Aizawl district, a higher AAR has been reported in males (269.4 per 100,000 males) in comparison to females (214.1 per 100,000 females).



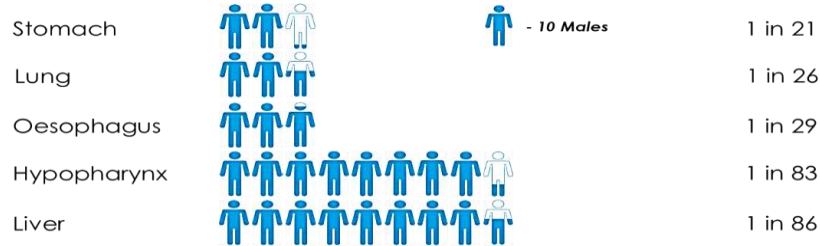
6.8 Age Specific Incidence Rate (ASpR)



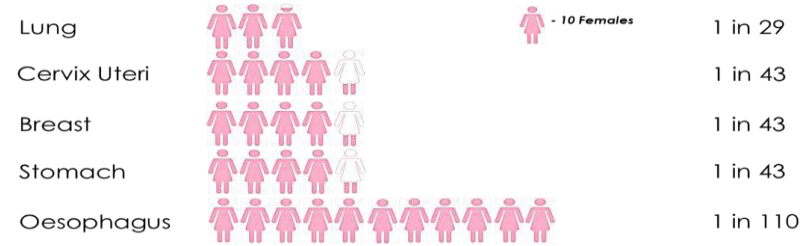
The Age-Specific Incidence Rates in both the genders show a rise from 30-34 years age-group onwards. In males, the highest Age-Specific Incidence Rate is seen at 75+ years while in females, the incidence is highest in the 70 to 74 years age group.

6.9 Probability of One in number of Persons developing cancer in 0-74 years age

Males



Females

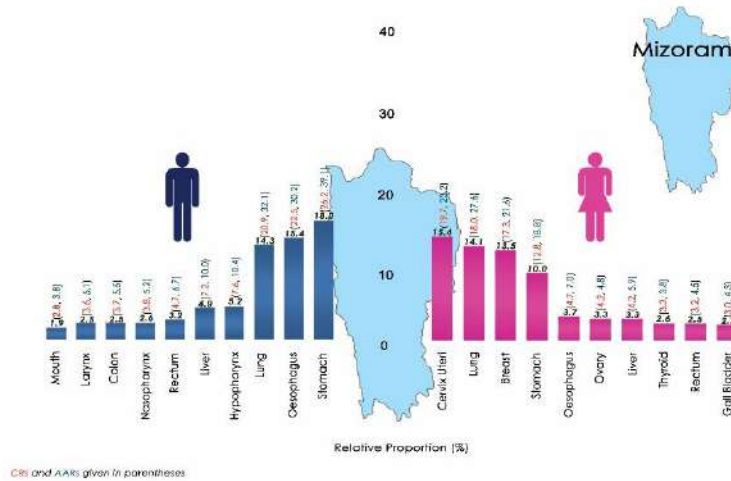


In males, the probability of developing stomach cancer is the highest (1 in every 21 males), followed by lung cancer (1 in every 26 males) and oesophageal cancer (1 in every 29 males). In females, the probability of developing lung cancer is highest (1 in every 29 females) followed by cancer of cervix uteri, breast cancer and stomach cancer (1 in every 43 females).





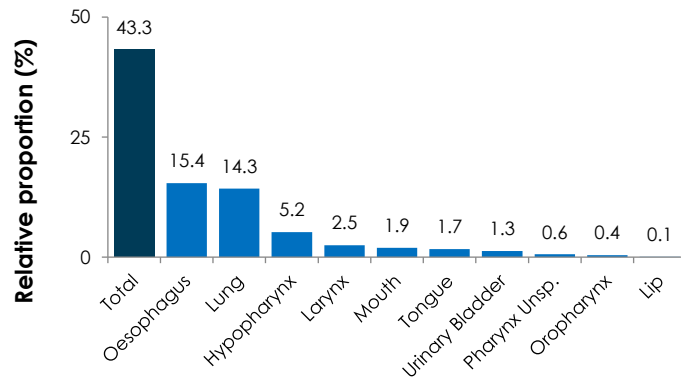
6.10 Leading Anatomical Sites of Cancer



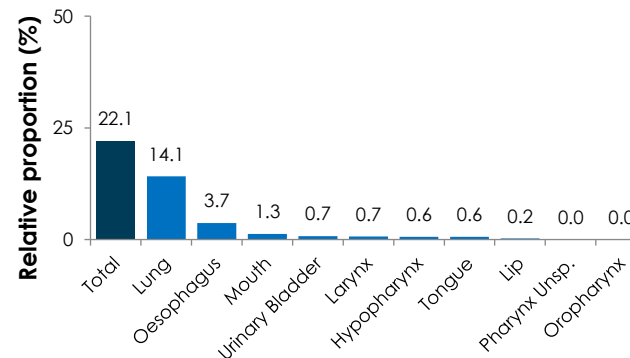
The proportion of stomach cancer (18.0%) is the highest among males, followed by cancer of the oesophagus (15.4%) and lung cancer (14.3%). In Females, Cervix uteri is a leading cancer site (15.4%) followed by lung (14.1%) and breast (13.5%).

6.11 Relative Proportion (%) of Cancer Sites Associated with the Use of Tobacco

Males



Females



Over one third (43.3 %) of cancers in males and close to one-fourth (22.1%) in females are tobacco use related cancer sites. Among these, lung (males-14.3%, females-14.1%) and oesophagus (males-15.4%, females-3.7%) are leading sites in both the genders.

6.12 Distribution of cancers according to Ethnicity





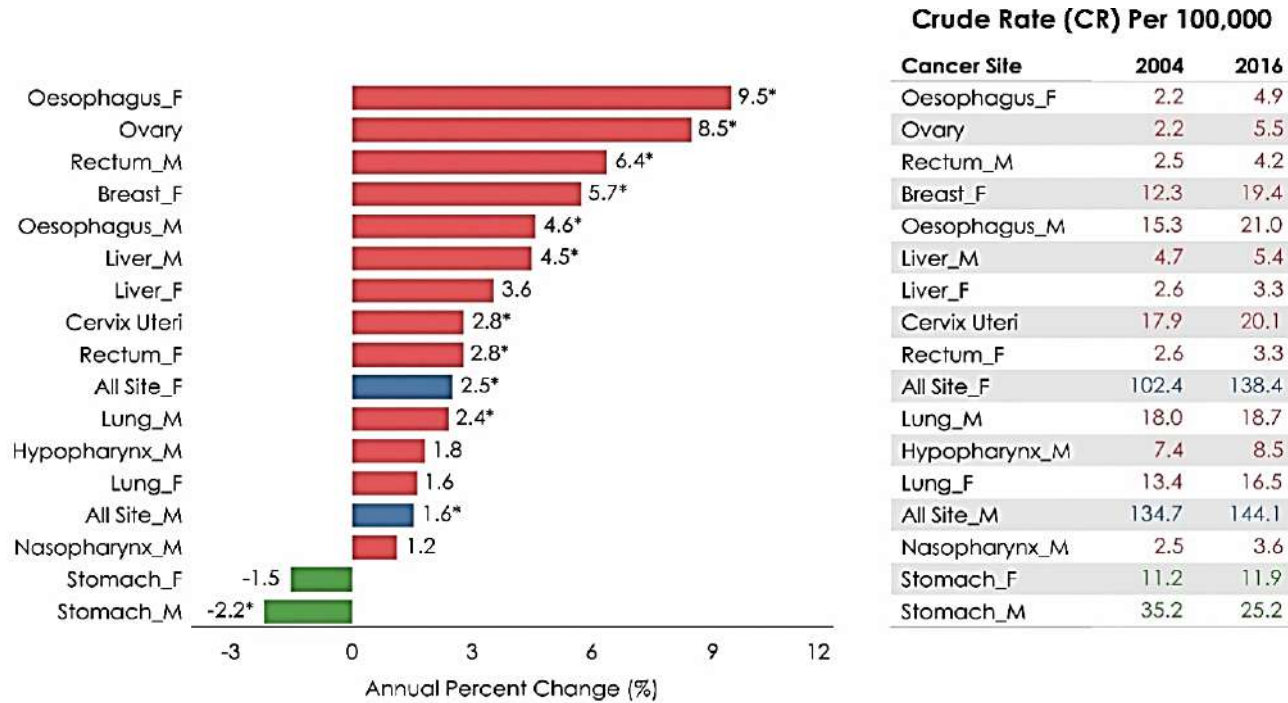
Name of Ethnic Group	Number	%
Mizo	7496	93.0
Anal	128	1.6
Chakma	121	1.5
Mara	92	1.1
Others	144	1.8

Total may not be 100%, because unspecified/unknown ethnic group cases are excluded.

Among all the ethnic groups, 93.0% of cancer cases occur in the Mizo ethnic group.



6.13 Trends over time in cancer incidence



Increase in APC, Decrease in APC, Increase or Decrease in APC for All Sites; * Significant Increase or Decrease at 95% Confidence Level

Annual Percent Change (APC) in cancer incidence for all sites is observed to be 1.6% in males and 2.5% in females from 2004 to 2016. In females, an increasing trend has been observed for cancer of oesophagus, ovary, breast, liver, cervix uteri, rectum and lung, whereas stomach cancer has shown a decline. Among males, cancer of rectum, oesophagus, liver, lung, hypopharynx and nasopharynx show an increasing trend, whereas stomach cancer is declining.





6.14 Case Fatality Ratio:

Case Fatality Ratio (CFR)			
Mizoram state	Incident cancer cases	Deaths	CFR%
Males	4323	2492	57.6
Females	3736	1566	41.9
Total	8059	4058	50.4
Aizawl district			
Males	2180	1216	55.8
Females	1900	757	39.8
Total	4080	1973	48.4

The total case fatality ratio (CFR) is 50.4%, being higher in males (57.6 %) compared to females (41.9%) in Mizoram state. In Aizawl district, total CFR is 48.4 %, higher in males (55.8%) than in females (39.8%).

Key observations

- Cancer ranks among the top five leading causes of death in the state.
- There is a significant increase in oesophageal cancer and rectal cancer in both genders.
- The increase in incidence for lung and liver cancer is substantial in males, and for ovary, breast and cervical cancer in females.
- The incidence of stomach cancer has declined over time.
- Close to two-thirds of males and half of the females are current tobacco users.
- About a quarter of the men consume alcohol, about one third are overweight or obese, and one fourth are hypertensive.
- The cause of more than half of the deaths are medically certified.



NAGALAND



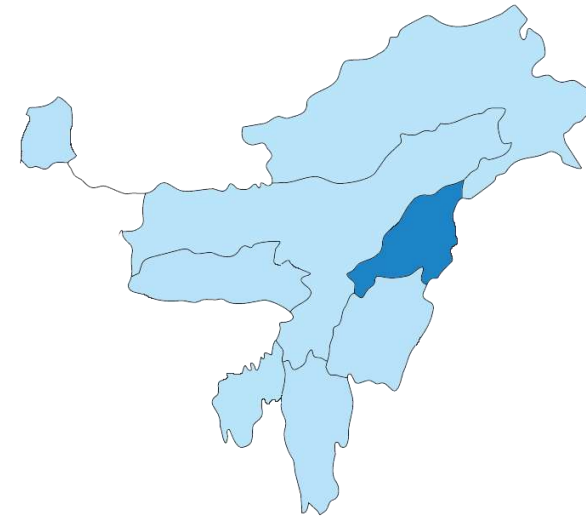


Chapter 7: Cancer and health status profile of Nagaland

A. Health Status Profile

7.1 Socio-demographic profile [1]

Population (Total)	1978502
Number of males	1024649
Number of females	953853
Sex Ratio	931
Major ethnic groups	Naga
Literacy rate	
Total	79.6
Males	82.8
Females	76.1



The total population of the region is 1978502, with a sex ratio of 931. The total literacy rate is 79.6%, being 82.8% in males and 76.1% in females.



7.2. NCD related Risk factor profile

Behavioral and lifestyle-related						
Tobacco users ^[2]						
Current tobacco use-smoked and/or smokeless (age 15 years and above) (%)						
Total	43.3					
Males	54.1					
Females	31.7					
Current smoked tobacco use (age 15 or above) (%)						
Total	13.2					
Males	25.5					
Females	0.5					
Current smokeless tobacco use (age 15 or above) (%)						
Total	39.0					
Males	46.0					
Females	31.5					
Alcohol consumption						
	Urban		Rural		Total	
	Men	Women	Men	Women	Men	Women
age 15 years or above (%) ^[13]	26.8	1.5	22.5	0.7	24.0	0.9
Metabolic risk factors ^[13]						
Overweight/Obese BMI >25 s (age 15-49 years) (%)	31.0	17.1	19.8	13.0	23.9	14.4
Raised blood pressure age 15 years or above (%)	26.0	19.9	30.1	23.6	28.7	22.4
Raised blood glucose (random) age 15 years or above (%)	13.4	9.3	11.9	9.2	12.4	9.3
Air Pollution, DALYs per 100,000 ^[3]	2221.87					

The prevalence of current tobacco use is 43.3%, higher for the smokeless form (39%) than the smoked form (13.2%). The DALYs' due to air pollution is reported to be 2221.87 per 100,000. 24.0% of males over the age of 15 years consumed alcohol, while the proportion of alcohol use in females was negligible. 23.9% of the men in the age group of 15-49 years are obese, which is higher than female prevalence (14.4%). A slightly higher proportion of males (28.7%) have raised blood pressure than females (22.4%). The prevalence of raised blood glucose is 9.3% in women and 12.4% in males.



7.3 Mortality related statistics

Life expectancy (2016) ^[5]	
Males	69.1
Females	74.5
Leading causes of death (MCCD 2018) ^[6]	
Major Cause Group	Percentage
Circulatory System	18.1
Respiratory System	13.9
Certain Infectious & Parasitic Diseases	10.1
Injury, Poisoning and Certain Other Consequences of External Causes	9.2
Neoplasms	9.2
Status of Medical certification of cause of death ^[6]	
Percentage of Medically Certified Deaths to Total Registered Deaths (%)	28.7
Medical Institutions covered under MCCD	11
Medical Institutions Reported MCCD Data as per the National List	5
Ranking of States/UTs in the medical certification of cause of death 2018	18

The life expectancy is marginally higher in females (74.5 years) than males (69.1 years). Diseases of the circulatory system comprise the leading cause of death (18.1%). The percentage of medically certified deaths to total registered deaths is 28.7%. The state ranks eighteenth in the medical certification of cause of death.



7.4 Health seeking behaviour and health practices [13]

	Urban	Rural	Total
History of cancer screening			
Women aged 30-49 ever undergone a breast examination for breast cancer (%)	0.4	0.2	0.3
Women aged 30-49 ever undergone an oral cavity examination for oral Cancer (%)	0.6	0.3	0.4
Women aged 30-49 ever undergone screening for cervical Cancer (%)	0.3	0.3	0.3
Men aged 30-49 ever undergone an oral cavity examination for oral Cancer (%)	0.1	0.3	0.2
Immunization history			
Children aged 12-23 months who have received 3 doses of penta or hepatitis B vaccine (%)	76.5	62.6	66.4
Household profile			
Population living in households that use an improved sanitation facility (%)	82.2	90.4	87.7
Households using clean fuel for cooking (%)	81.1	24.9	43.0
Households with any usual member covered under a health insurance/financing scheme (%)	15.0	23.1	20.5

The proportion of women who have undergone screening is 0.3% for breast cancer, 0.4% for oral cancer and 0.3% for cervical cancer. Only 0.2% of men had a history of screening for oral cancer. As many as 66% of children in 12 to 23 months had received immunization with Penta and hepatitis B vaccine. About 87.7% of the population is living in households that use an improved sanitation facility—only 43.0% of the population are using clean fuel for cooking. The coverage with a health insurance scheme or financing scheme is low at a figure of 20.5%.



7.5 Status of the health system

A. Public sector health facilities ^{[7],[8]}	Number
Sub centres (SC)	397
Health and Wellness Centre - Sub Centre (HWC-SC)	56
Primary Health Centres (PHC)	126
Health and Wellness Centre - Primary Health Centre (HWC-PHC)	05
Community Health Centres (CHC)	21
Sub-district Hospitals (SDH)	00
District Hospitals (DH)	11
Number of government allopathic doctors and dental surgeons	320
B. Tertiary health care facilities	
Medical Colleges ^[9]	00
State cancer institute ^[10]	00
Tertiary cancer care centre ^[10]	01
Regional cancer care centre ^[11]	00
C. State government health scheme ^[18]	Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (AB-PMJAY)

The state has 397 SC, 56 HWC-SCs', 126 PHCs, 05 HWC – PHCs', 21 CHCs' and 11 DHs. There is one Tertiary Cancer Centre. The state is covered under Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (AB-PMJAY).



B. Profile of Cancer

7.6 Details of Cancer Registries in the State

Population Based Cancer Registry	
Location	Naga Hospital Authority, Kohima
Established Year	2010
Coverage Area	Kohima & Dimapur
Sources of registration	30
Area (in Sq.km)	2390
Urban & Rural (%)	49.3 & 50.7
Hospital Based Cancer Registries: 1. Christian Institute of Health Science and Research, Dimapur 2. Eden Medical Centre, DIMAPUR 3. Naga Hospital Authority, Kohima	

The state has one PBCR and three HBCRs. The Population Based Cancer Registry is located at Naga Hospital, Kohima, covering Kohima and Dimapur through 30 sources of registration.

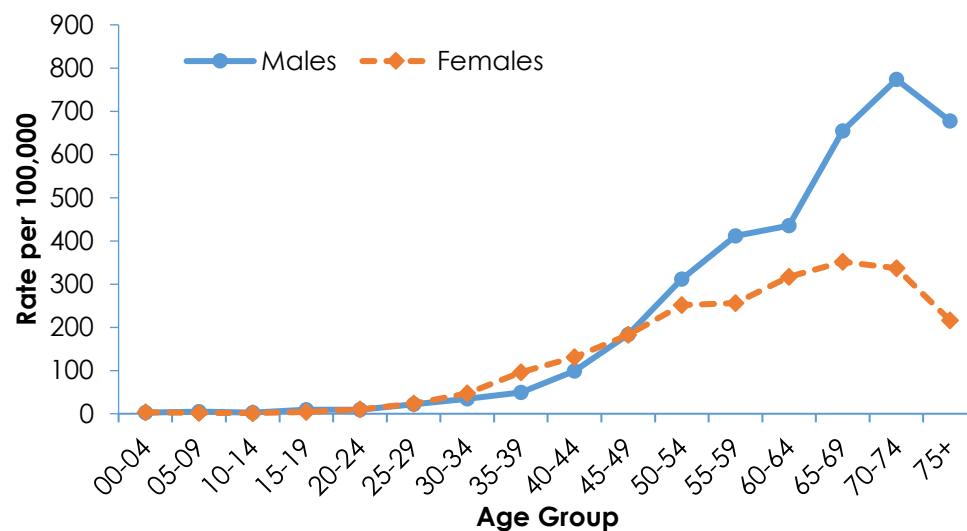


7.7 Number of cancer cases and Age Adjusted Incidence Rate (AAR) per 100,000 population

Gender	Number of New Cancer Cases	AAR
Males	1403	124.5
Females	992	88.2

The AAR was higher in males (124.5 per 100,000 males) than females (88.2 per 100,000 females)

7.8 Age Specific Incidence Rate (ASpR)

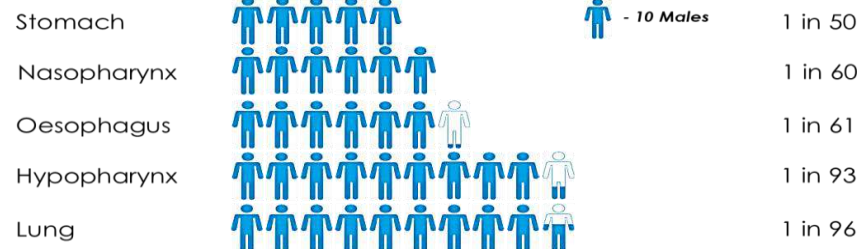


The Age-Specific Incidence Rates in both the genders shows a rise from 25-29 years age-group onwards. In males, the highest Age-Specific Incidence Rate is seen in the 70 to 74 years age-group, while in females, the incidence rates were increased in the 65 to 69 age categories.

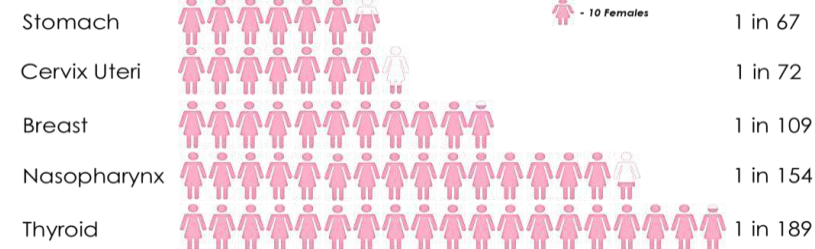


7.9 Probability of One in number of Persons developing cancer in 0-74 years age

Males

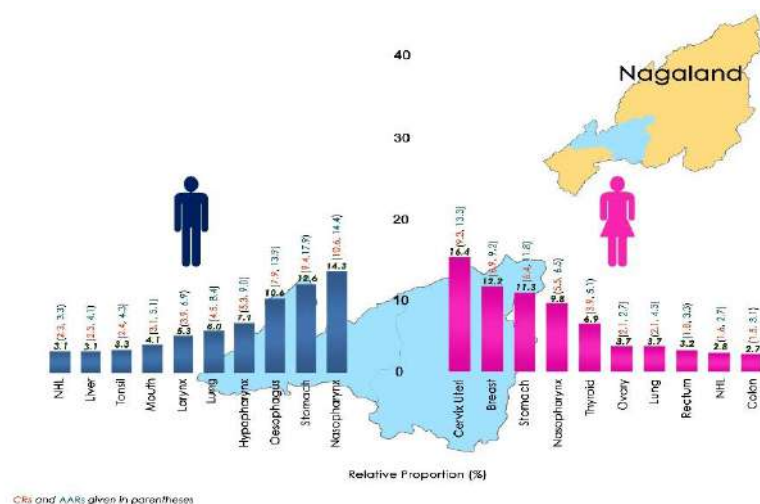


Females



The probability of developing stomach cancer is the highest in both the genders (1 in every 50 males and 1 in every 67 females), followed by nasopharyngeal cancer in males (1 in every 60 males) and cancer of cervix-uteri in females (1 in every 72 females).

7.10 Leading Anatomical Sites of Cancer



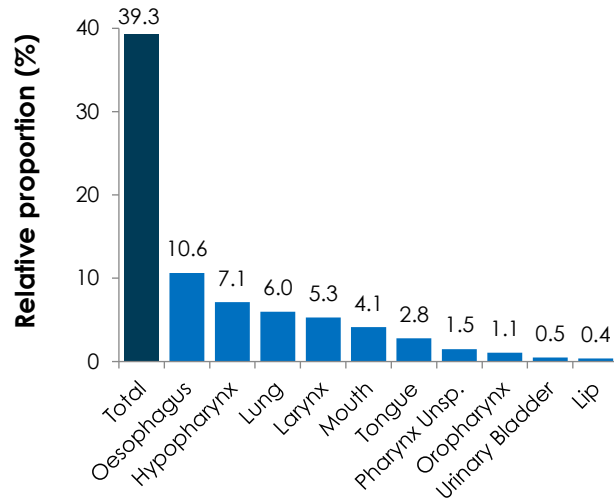
The proportion of nasopharyngeal cancer (14.3%) is highest among males, followed by stomach cancer (12.6%) and oesophageal cancer (10.6%). In Females, cervix-uteri is the leading cancer site (16.4%) followed by breast (12.2%) and stomach (11.3%).



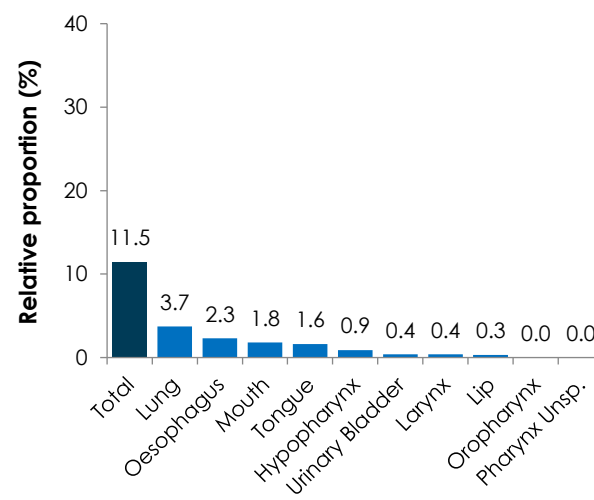


7.11 Relative Proportion (%) of Cancer sites Associated with the Use of Tobacco

Males



Females



Over a third (39.3 %) of cancers in males and 11.5% in females are related to tobacco use related cancer sites. Among these, oesophagus (10.6%) and lung (3.7%) are leading sites in males and females.

7.12 Distribution of cancers according to ethnicity

Name of Ethnic Group	Number	%
Naga	1755	73.3
Nepalese	77	3.2
Ahom	58	2.4
Mao	45	1.9
Bhutias	27	1.1
Others	267	11.1

Total may not be 100%, because unspecified/unknown ethnic group cases are excluded.

Among all the ethnic groups, 73.3% of cancer cases are recorded in the Naga ethnic group.





7.13 Case Fatality Ratio (CFR)

Case Fatality Ratio (CFR)			
Nagaland	Incident cancer cases	Deaths	CFR%
Males	1403	298	21.2
Females	992	119	12.0
Total	2395	417	17.4

The total case fatality ratio is 17.4%, higher in males (21.2%) than females (12.0 %).

Key observations

- Cancer ranks among the top five leading causes of death in the state.
- The risk of developing stomach cancer is highest in both genders.
- Cancer of the nasopharynx is the leading site in males.
- Current tobacco use is present in nearly half of the population, while about one-fourth consume alcohol and are overweight/obese and hypertensive.
- The case-fatality ratio due to cancer is almost double in men than women.
- The cause of less than one-third of the deaths is medically certified.
- Less than a quarter of the population is covered by health insurance.
- The state has a shortage of tertiary cancer care facilities.



SIKKIM



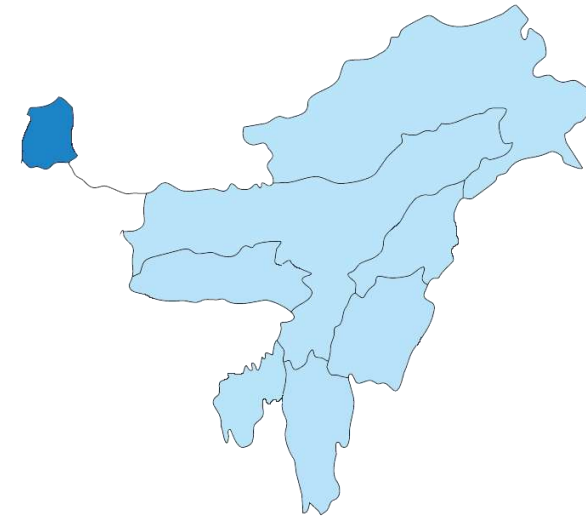


Chapter 8: Cancer and health status profile of Sikkim

A. Health Status Profile

8.1 Socio-demographic profile ^[1]

Population (Total)	610577
Number of males	323070
Number of females	287507
Sex Ratio	890
Major ethnic groups	Nepalese, Bhutias, Lepchas
Literacy rate (%)	
Total	81.4
Males	86.6
Females	75.6



The total population of the region is 610577, with a sex ratio of 890. The total literacy rate is 81.4%, being 86.6% in males and 75.6% in females. The major ethnic groups include Nepalese, Bhutias and Lepchas.



8.2. NCD related Risk factor profile

Behavioral and lifestyle-related							
Tobacco use ^[2]							
Current tobacco use-smoked and/or smokeless (age 15 years and above) (%)							
Total						17.9	
Males						26.4	
Females						8.4	
Current smoked tobacco use (age 15 or above) (%)							
Total						10.9	
Males						17.4	
Females						3.6	
Current smokeless tobacco use (age 15 or above) (%)							
Total						9.7	
Males						13.8	
Females						5.1	
Alcohol consumption							
	Urban		Rural		Total		
	Men	Women	Men	Women	Men	Women	
age 15 years or above (%) ^[13]	37.6	12.7	41.1	18.4	39.8	16.2	
Metabolic risk factors^[13]							
Overweight/Obese BMI >25 s (age 15-49 years) (%)	40.1	41.0	33.9	30.8	36.3	34.7	
Raised blood pressure (age 15 years or above) (%)	38.6	32.3	43.1	35.8	41.6	34.5	
Raised random blood glucose (age 15 years or above) (%)	16.2	14.6	15.5	10.9	15.7	12.2	
Air Pollution, DALYs per 100,000 ^[3]	2132.87						

The prevalence of current tobacco use is 17.9%, higher for the smoked form (10.9%) than the smokeless form (9.7%). The DALYs' due to air pollution is reported to be 2132.87 per 100,000. Over one-third, (39.8%) of males over the age of 15 years consumed alcohol, while the proportion of alcohol use in females is 16.2%. Over one-third of the women in the age group of 15-49 years are obese (34.7%), which is slightly lower than the prevalence in males (36.3%). A higher proportion of males (41.6%) have raised blood pressure than females (34.5%). The prevalence of raised blood glucose is 12.2% in women and 15.7% in men.



8.3 Mortality related statistics

Life expectancy (2016) ^[5]	
Males	70.5
Females	75.8
Leading causes of death (MCCD 2018) ^[6]	
Major Cause Group	Percentage
Circulatory System	28.8
Other Groups	25.0
Respiratory System	12.0
Certain Infectious & Parasitic Diseases	9.8
Neoplasms	7.5
Status of Medical certification of cause of death ^[6]	
Percentage of Medically Certified Deaths to Total Registered Deaths (%)	42.5
Medical Institutions covered under MCCD	32
Medical Institutions Reported MCCD Data as per the National List	29
Ranking of States/UTs in the medical certification of cause of death 2018	13

The life expectancy is marginally higher in females (75.8 years) than males (70.5 years). Circulatory system causes comprise the leading cause of death (28.8%). The percentage of medically certified deaths to total registered deaths is 42.5. The state ranks thirteenth in the medical certification of cause of death.



8.4 Health seeking behaviour and health practices [13]

	Urban	Rural	Total
History of cancer screening			
Women aged 30-49 ever undergone a breast examination for breast cancer (%)	0.0	0.2	0.1
Women aged 30-49 ever undergone an oral cavity examination for oral Cancer (%)	1.4	0.4	0.8
Women aged 30-49 ever undergone screening for cervical Cancer (%)	0.7	0.5	0.6
Men aged 30-49 ever undergone an oral cavity examination for oral cancer (%)	7.1	2.3	4.0
Immunization history			
Children aged 12-23 months who have received 3 doses of penta or hepatitis B vaccine (%)	-	86.8	89.1
Household profile			
Population living in households that use an improved sanitation facility (%)	84.0	89.3	87.3
Households using clean fuel for cooking (%)	97.5	64.4	78.4
Households with any usual member covered under a health insurance/financing scheme (%)	31.2	21.6	25.7

The proportion of women who have undergone screening is 0.1% for breast cancer, 0.8% for oral cancer and 0.6% for cervical cancer. Only 4% of men had a history of screening for oral cancer. As many as 89% of children in 12 to 23 months had received immunization with Penta and hepatitis B vaccine. About 87.3% of the population is living in households that use an improved sanitation facility—over two-thirds (78.4%) of the population are using clean fuel for cooking. The coverage with a health insurance scheme or financing scheme is low at a figure of 25.7%.



8.5 Status of the health system

A. Public sector health facilities ^{[7],[8]}	Number
Sub centres (SC)	148
Health and Wellness Centre - Sub Centre (HWC-HC)	28
Primary Health Centres (PHC)	25
Health and Wellness Centre - Primary Health Centre (HWC-PHC)	05
Community Health Centres (CHC)	2
Sub-district Hospitals (SDH)	00
District Hospitals (DH)	04
Number of government allopathic doctors and dental surgeons	84
B. Tertiary health care facilities	
Medical Colleges ^[9]	01
State cancer institute ^[10]	00
Tertiary cancer care centre ^[10]	01
Regional cancer care centre ^[11]	00
C. State government health scheme ^[19]	<ol style="list-style-type: none"> 1. Comprehensive annual and total health checkup (CATCH) Program 2. Mukhya Mantri Jeevan Raksha Kosh 3. Sikkim State Illness Assistance Fund (SSI AF)

The state has 148 SCs, 28 HWC– SCs', 25 PHCs', 05 HWC – PHCs', 2 CHCs' and 4 DHs. There is only one medical college and one Tertiary Cancer Centre. The state implements health schemes known as Comprehensive annual and total health checkup (CATCH) Program, Mukhya Mantri Jeevan Raksha Kosh and Sikkim State Illness Assistance Fund (SSI AF).



B. Profile of Cancer

8.6 Details of Cancer registries in the State

Population Based Cancer Registry	
Location	Sir Thutob Namgyal Memorial (STNM) Multispecialty Hospital, Gangtok
Established Year	2003
Coverage Area	Sikkim state
Sources of Registration	36
Area (in Sq.km)	7096
Urban & Rural (%)	25.2 & 74.8

The population based cancer registry is situated at the STNM Multispecialty Hospital, Gangtok, covering the entire state through 36 sources of registration.

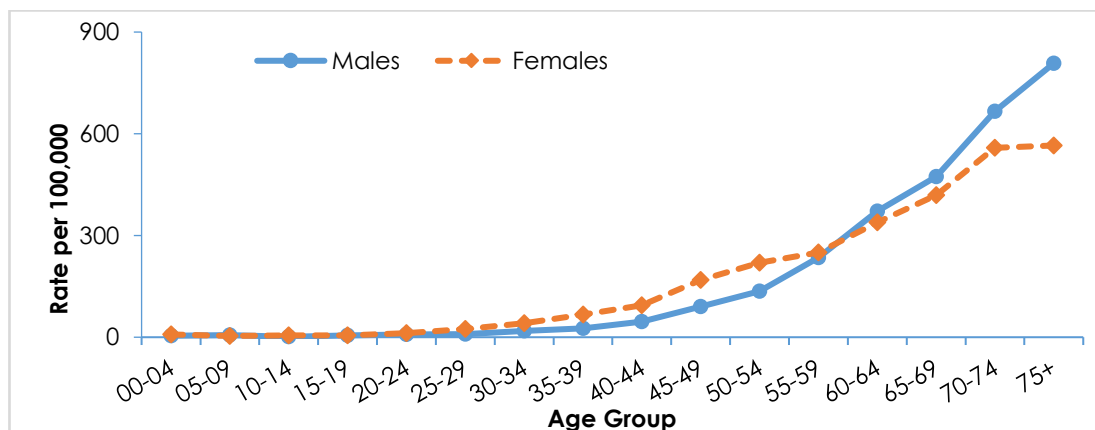
8.7 Number of cancer cases and Age Adjusted Incidence Rate (AAR) per 100,000 population

Gender	Number of New Cancer Cases	AAR
Males	1172	88.7
Females	1131	97.0

The AAR is higher in females (97.0 per 100,000 females) than males (88.7 per 100,000 males).



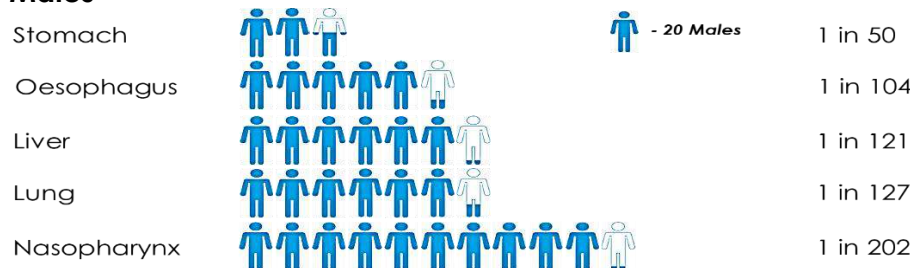
8.8 Age Specific Incidence Rate (ASpR)



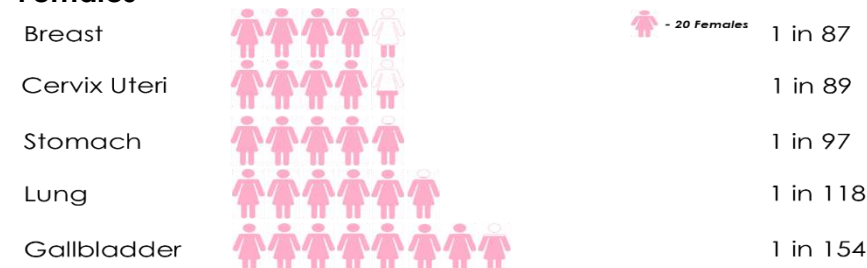
The Age-Specific Incidence Rates in both the genders shows a rise from 30-34 years age-group onwards. The highest Age-Specific Incidence Rate is seen in at 75+ years in males and females.

8.9 Probability of One in number of Persons developing cancer in 0-74 years age

Males



Females

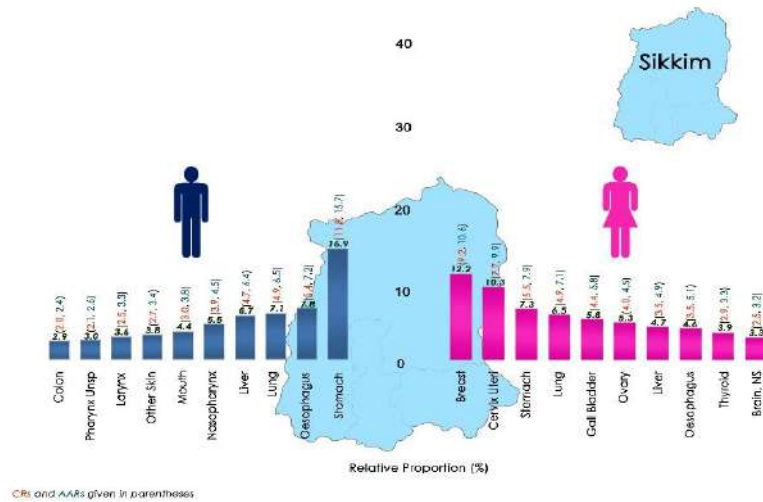


The probability of developing stomach cancer is the highest in males (1 in every 50 males), followed by oesophageal cancer (1 in every 104 males) and cancer of liver (1 in every 121 males). In females, the probability of developing breast cancer is found to be highest (1 in every 87 females) followed by cancer of cervix-uteri (1 in every 89 females) and cancer of stomach (1 in every 97 females).





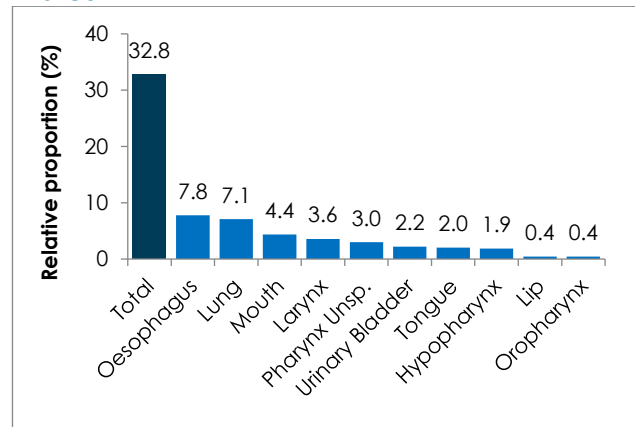
8.10 Leading Anatomical Sites of Cancer



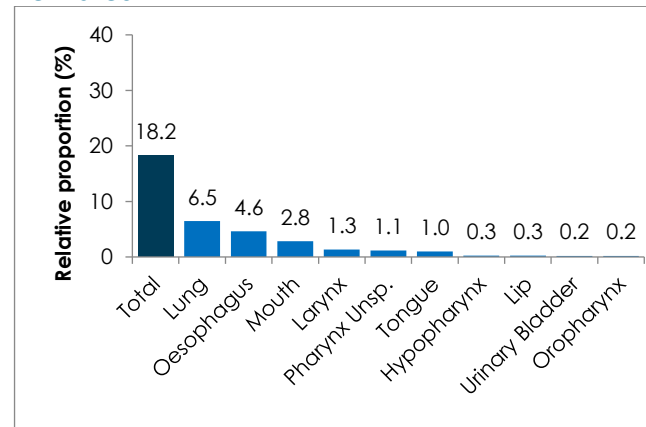
The proportion of stomach cancer (16.9 %) is highest among males, followed by oesophagus (7.8%) and lung (7.1 %). In females, the breast is a leading cancer site (12.2%) followed by cervix-uteri (10.3 %) and stomach (7.3%).

8.11 Relative Proportion (%) of Cancer sites Associated with the Use of Tobacco

Males



Females



Approximately one-third (32.8%) of cancers in males and (18.2%) in females are tobacco use related cancer sites. Among these, lung (7.1% in males; 6.5% in females) and oesophagus (7.8% in males; 4.6% in females) are the leading sites in both the genders.





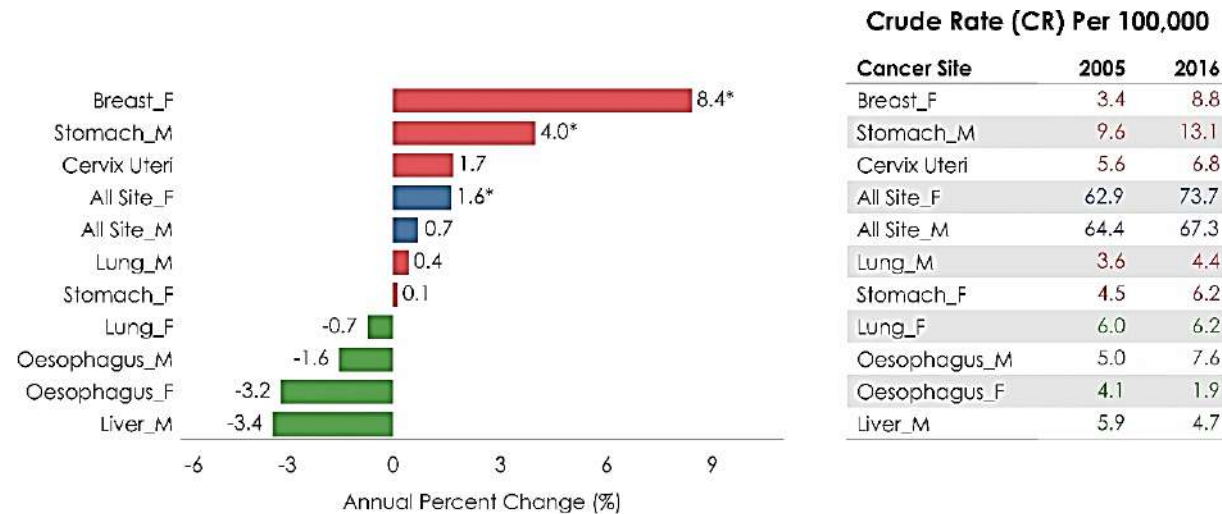
8.12 Distribution of cancers according to ethnicity

Name of Ethnic Group	Number	%
Nepalese	1468	63.7
Bhutias	451	19.6
Lepchas	184	8.0
Others	50	2.2

Total may not be 100%, because unspecified/unknown ethnic group cases are excluded.

Among all the ethnic groups, over half (63.7%) of cancer cases are reported in the Nepalese ethnic group.

8.13 Trends over time in cancer incidence



Increase in APC, Decrease in APC, Increase or Decrease in APC for All Sites; * Significant Increase or Decrease at 95% Confidence Level

The annual percent change (APC) in cancer incidence for all cancer sites is 1.6% in females and 0.7% in males, from 2005 to 2016. In females, breast, cervix-uteri and stomach cancer show an increasing trend, whereas cancer of the oesophagus and lung decreases. Cancer of the stomach and lung shows a rising trend in males, whereas cancer of oesophagus and liver have declined.





8.14 Case Fatality Ratio (CFR)

Case Fatality Ratio (CFR)			
Sikkim State	Incident cancer cases	Deaths	CFR%
Males	1172	603	51.5
Females	1131	513	45.4
Total	2303	1116	48.5

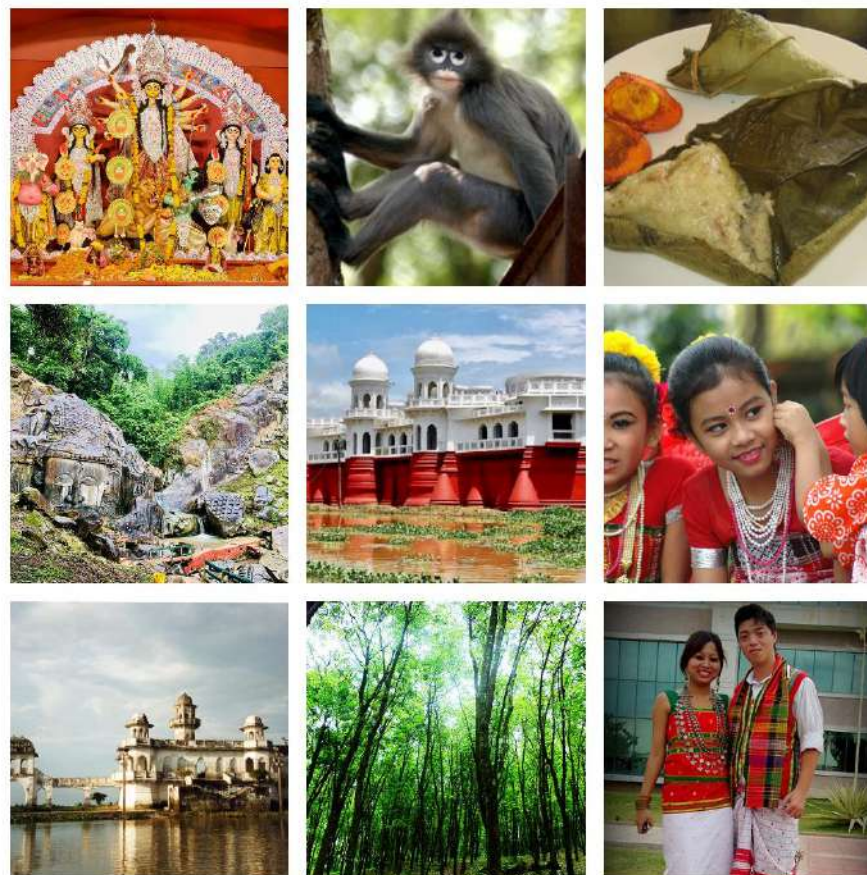
The total case fatality ratio is 48.5%, higher in males (51.5%) than females (45.4%).

Key observations

- Cancer ranks among the top five leading causes of death in the state.
- The incidence of cancer and the rise in incidence is higher in females.
- Breast is the leading cancer site in females, and the rise in its incidence is significant.
- The stomach and oesophagus are leading cancer sites in males.
- The incidence of oesophageal cancer has declined in both genders.
- Over one-third of the men and, close to one-fifth of women consume alcohol.
- More than one-third of the population is overweight/obese and hypertensive.
- The cause of less than half of the deaths is medically certified.
- A health insurance scheme covers only a quarter of the population.



TRIPURA



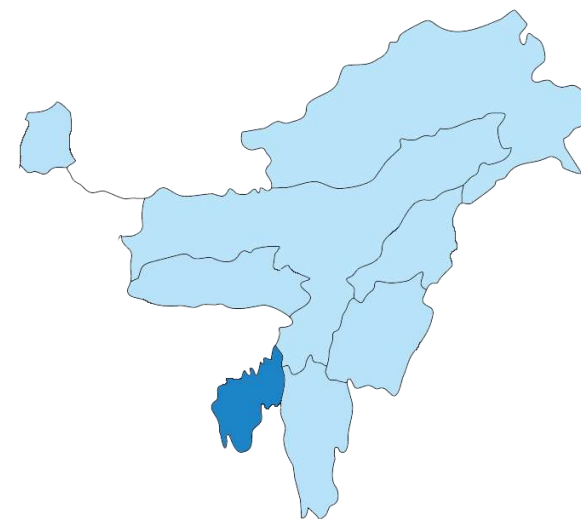


Chapter 9: Cancer and health status profile of Tripura

A. Health Status Profile

9.1 Socio-demographic profile [1]

Population (Total)	3673917
Number of males	1874376
Number of females	1799541
Sex Ratio	960
Major ethnic groups	Kayastha, Koibarta, Jogi, Brahmin
Literacy rate (%)	
Total	87.2
Males	91.5
Females	82.7



The total population of the region is 3673917, with a sex ratio of 960. The total literacy rate is 87.2%, being 91.5% in males and 82.7% in females. The major ethnic groups include Kayastha, Koibarta, Jogi and Brahmin.



9.2. NCD related Risk factor profile

Behavioral and lifestyle-related							
Tobacco use ^[2]							
Current tobacco use-smoked and/or smokeless (age 15 years and above) (%)							
Total						64.5	
Males						67.5	
Females						61.4	
Current smoked tobacco use (age 15 or above) (%)							
Total						27.7	
Males						44.4	
Females						10.3	
Current smokeless tobacco use (age 15 or above) (%)							
Total						48.5	
Males						40.8	
Females						56.5	
Alcohol consumption							
	Urban		Rural		Total		
	Men	Women	Men	Women	Men	Women	
age 15 years or above (%) ^[13]	26.9	0.8	35.9	8.4	33.1	6.2	
Metabolic risk factors ^[13]							
Overweight/Obese BMI >25 s (age 15-49 years) (%)	28.3	29.2	21.4	18.4	23.4	21.5	
Raised blood pressure (age 15 years or above) (%)	27.3	26.4	20.6	18.6	22.7	20.9	
Raised random blood glucose (age 15 years or above) (%)	21.2	21.1	18.5	16.3	19.3	17.7	
Air Pollution, DALYs per 100,000 ^[3]	3525.04						

The prevalence of current tobacco use is (64.5%), higher for the smokeless form (48.5%) than the smoked form (27.7%). The DALYs' due to air pollution is reported to be 3525.04 per 100,000. One-third, (33.1%) of males over the age of 15 years consumed alcohol, while the proportion of alcohol use in females was 6.2%. Over 23.4% of the men in the age group of 15-49 years are obese, which is slightly higher than female prevalence (21.5%). A somewhat higher proportion of males (22.7%) have raised blood pressure than females (20.9%). The prevalence of raised random blood glucose is 17.7% in women and 19.3% in men.



9.3 Mortality related statistics

Life expectancy (2016) ^[5]	
Males	66.3
Females	71.5
Leading causes of death (MCCD 2018) ^[6]	
Major Cause Group	Percentage
Circulatory System	38.3
Respiratory System	10.2
Neoplasms	9.1
Certain Infectious & Parasitic Diseases	7.0
Certain Conditions originating in Perinatal Period	3.9
Status of Medical certification of cause of death ^[6]	
Percentage of Medically Certified Deaths to Total Registered Deaths (%)	22.3
Medical Institutions covered under MCCD	124
Medical Institutions Reported MCCD Data as per the National List	124
Ranking of States/UTs in the medical certification of cause of death 2018	20

The life expectancy is marginally higher in females (71.5 years) than males (66.3 years). Circulatory system causes comprise the leading cause of death (38.3%). The percentage of medically certified deaths to total registered deaths is 22.3%. The state ranks twentieth in the medical certification of cause of death.



9.4 Health seeking behaviour and health practices [13]

	Urban	Rural	Total
History of cancer screening			
Women aged 30-49 ever undergone a breast examination for breast cancer (%)	0.8	0.2	0.4
Women aged 30-49 ever undergone an oral cavity examination for oral Cancer (%)	0.8	0.5	0.6
Women aged 30-49 ever undergone screening for cervical Cancer (%)	1.2	0.4	0.7
Men aged 30-49 ever undergone an oral cavity examination for oral Cancer (%)	0.0	0.3	0.2
Immunization history			
Children aged 12-23 months who have received 3 doses of penta or hepatitis B vaccine (%)	88.1	80.7	82.5
Household profile			
Population living in households that use an improved sanitation facility (%)	78.5	71.6	73.6
Households using clean fuel for cooking (%)	75.4	32.6	45.3
Households with any usual member covered under a health insurance/financing scheme (%)	24.9	36.5	33.0

The proportion of women who have undergone screening is 0.4% for breast cancer, 0.6% for oral cancer and 0.7% for cervical cancer. Only 0.2% of men had a history of screening for oral cancer. As many as 82.5% of children in 12 to 23 months had received immunization with Penta and hepatitis B vaccine. About 73.6% of the population live in households that use an improved sanitation facility—only 45.3% of the population uses clean fuel for cooking. The coverage with a health insurance scheme or financing scheme is low at a figure of 33.0%.



9.5 Status of the health system

A. Public sector health facilities ^{[7],[8]}	
Sub centres (SC)	966
Health and Wellness Centre - Sub Centre (HWC-SC)	40
Primary Health Centres (PHC)	82
Health and Wellness Centre - Primary Health Centre (HWC-PHC)	31
Community Health Centres (CHC)	22
Sub-district Hospitals (SDH)	12
District Hospitals (DH)	07
Number of government allopathic doctors and dental surgeons	418
B. Tertiary health care facilities	
Medical Colleges ^[9]	02
State cancer institute ^[10]	01
Tertiary cancer care centre ^[10]	00
Regional cancer care centre ^[11]	01
C. State government health scheme ^[20]	Ayushman Bharat -Pradhan Mantri Jan Arogya Yojana

The state has 966 SCs, 40 HWC – SCs', 82 PHCs', 31 HWC – PHCs', 22 CHCs', 12 SDHs and 7 DHs. There are two medical colleges and one State Cancer Institute and Regional Cancer Centre. The state implements Ayushman Bharat -Pradhan Mantri Jan Arogya Yojana.



B. Profile of Cancer

9.6 Details of Cancer Registries in the State

Population Based Cancer Registry	
Location	Regional Cancer Centre, Agartala
Established Year	2010
Coverage Area	Tripura state
Sources of Registration	30
Area (in Sq.km)	10492
Urban & Rural (%)	26.2 & 73.8
Hospital Based Cancer Registry: Regional Cancer Centre, Agartala	

The Population Based Cancer Registry is located at Regional Cancer Centre, Agartala and covers the entire state through 30 sources of registration.

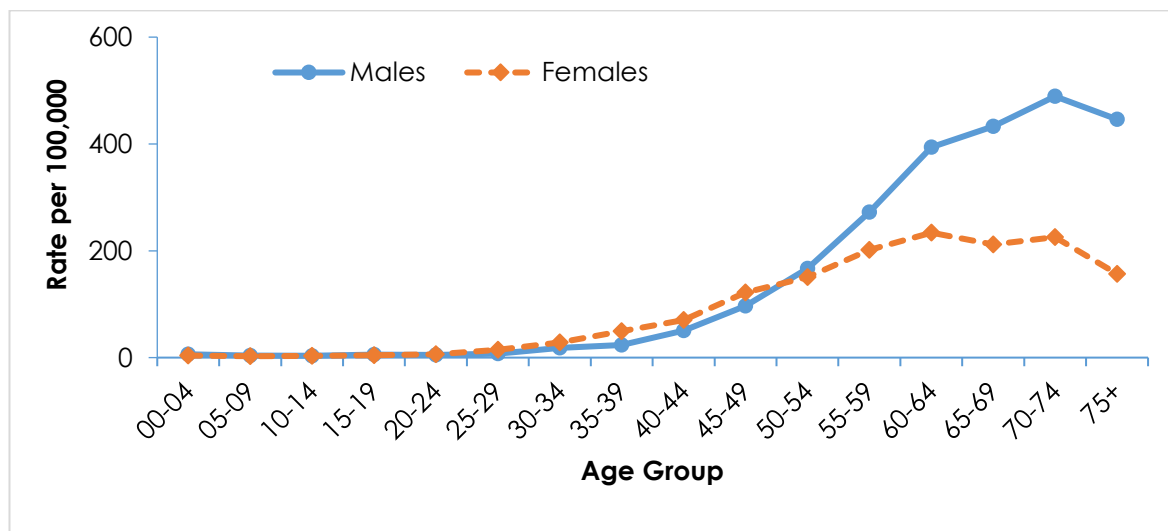
9.7 Number of cancer cases and Age Adjusted Incidence Rate (AAR) per 1,00,000 population

Gender	Number of New Cancer Cases	AAR
Males	6559	80.9
Females	4914	58.3

The AAR is higher in males (80.9 per 100,000 males) than females (58.3 per 100,000 females) in Tripura state.



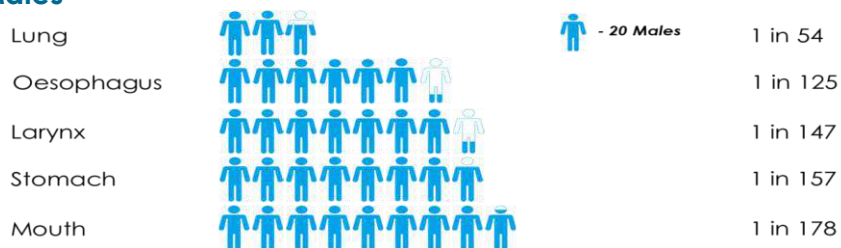
9.8 Age Specific Incidence Rate (ASpR)



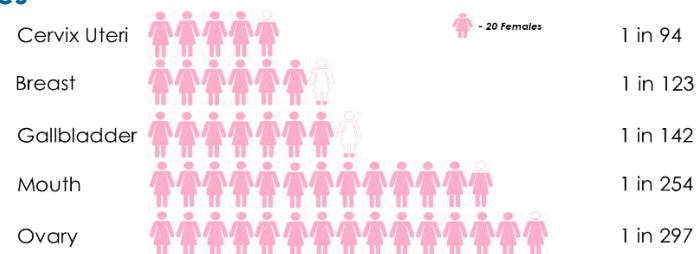
The Age-Specific Incidence Rates (ASpR) in both the genders show a rise from 30-34 years age-group onwards. In males, the highest Age-Specific Incidence Rate is seen in the 70-74 years age-group, whereas in females it was highest in 60-64 age group.

9.9 Probability of One in number of Persons developing cancer in 0-74 years age

Males



Females

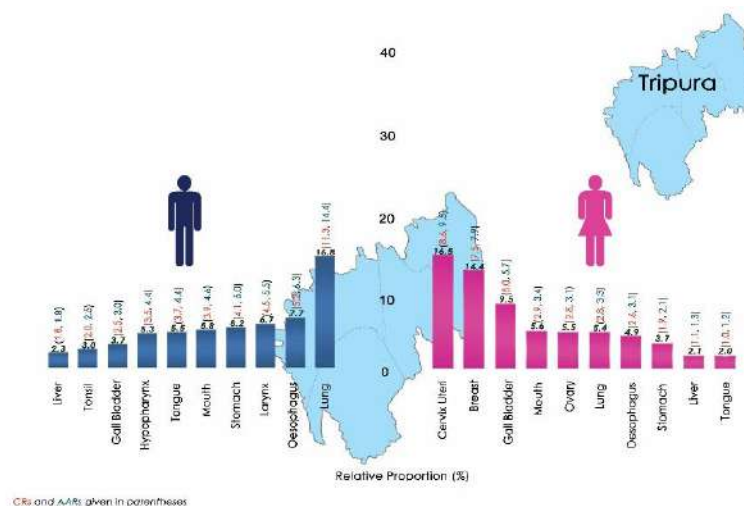


The probability of developing lung cancer is the highest in males (1 in every 54 males), followed by oesophageal cancer (1 in every 125 males) and cancer of larynx (1 in every 147 males). Among females, the probability of developing cancer of cervix-uteri is highest (1 in every 94 females) followed by breast cancer (1 in every 123 females) and cancer of gallbladder (1 in every 142 females).





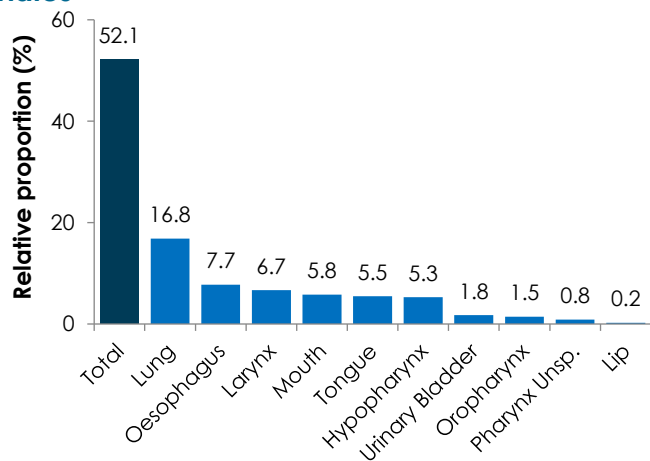
9.10 Leading Anatomical Sites of Cancer



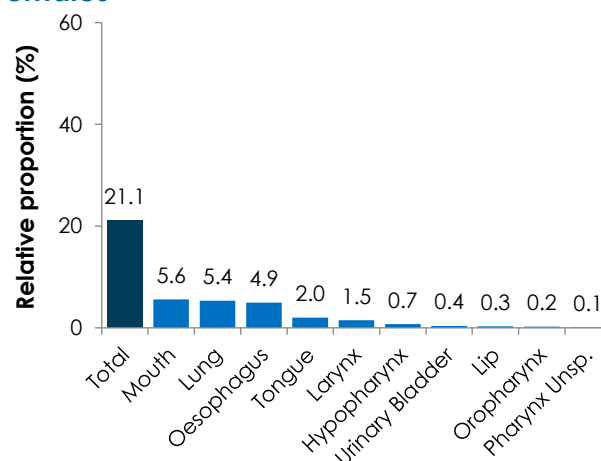
The proportion of lung cancer (16.8 %) is highest among males, followed by oesophageal cancer (7.7%) and cancer of the larynx (6.7%). In females, the cervix-uteri is a leading cancer site (16.5%) followed by breast (14.4%) and gallbladder (9.5%).

9.11 Relative Proportion (%) of Cancer sites Associated with the Use of Tobacco

Males



Females



Approximately half (52.1%) of cancers in males and close to one-fourth (21.1%) in females are tobacco use related cancer sites. Among these, lung (16.8%) and oesophagus (7.7%) are leading cancer sites in males, whereas mouth (5.6%) and lung (5.4%) are the leading cancer sites in females.





9.12 Distribution of cancers according to ethnicity

Name of Ethnic Group	Number	%
Kayastha	4776	41.6
Koibarta	1566	13.6
Jogi	1084	9.4
Brahmin	593	5.2
Tea-tribe	164	1.4
Bishnupriya	119	1.0
Others	1630	14.2

Total may not be 100%, because unspecified/unknown ethnic group cases are excluded.

Among all the ethnic groups, 41.6% of cancer cases are recorded in Kayastha ethnic group

9.13 Case-Fatality Ratio

Case Fatality Ratio (CFR)			
Tripura state	Incident cancer cases	Deaths	CFR%
Males	6559	3682	56.1
Females	4914	2395	48.7
Total	11473	6077	53.0

The total case-fatality ratio is 53.0%, higher in males (56.1%) than females (48.7%).

Key observations

- Cancer ranks among the top five leading causes of death in the state.
- The incidence of cancer is 1.4 times higher in males than females.
- The lung and oesophagus are the first two leading site of cancer in males, while in females, it is cervical cancer followed by breast cancer.
- Current use of tobacco is present in nearly two-thirds of males and females, while about one-third of the men consume alcohol.
- The cause of less than a quarter of the deaths is medically certified.
- Less than half of the population use clean fuel.
- Only one-third of the households are covered with a health insurance scheme.



References

1. Census 2011. Office of the Registrar General & Census Commissioner, India. Ministry of Home Affairs, Government of India.
2. Tata Institute of Social Sciences (TISS), Mumbai and Ministry of Health and Family Welfare, Government of India. Global Adult Tobacco Survey GATS 2 India 2016-17.
3. India State-Level Disease Burden Initiative Air Pollution Collaborators. Health and economic impact of air pollution in the states of India: the Global Burden of Disease Study 2019.
4. International Institute for Population Sciences (IIPS) and ICF. 2017. National Family Health Survey (NFHS-4), 2015-16: India. Mumbai: IIPS
5. India: Health of the Nation's States — The India State-Level Disease Burden Initiative. New Delhi: ICMR, PHFI, and IHME; 2017.
6. Office of the registrar general, India. government of India, Report on medical certification of cause of death 2018
7. Government of India Ministry of Health and Family Welfare Statistics Division Rural Health Statistics, 2018-19.
8. Central Bureau of Health Intelligence. Dte General of Health Services, Ministry of Health and Family Welfare, Govt of India National Health Profile 2019. 14th Issue
9. National Medical Commission. www.nmc.org.in
10. Press Information Bureau (<https://pib.gov.in/PressReleasePage.aspx?PRID=1576623>)
11. National Cancer Control Programme (<https://main.mohfw.gov.in/Organisation/Departments-of-Health-and-Family-Welfare/national-cancer-control-programme>)
12. <https://pmjay.gov.in/>
13. Ministry of Health and Family Welfare. National Family Health Survey-5, 2019-20.
14. Govt. of Assam (<https://hfw.assam.gov.in/schemes>)
15. Govt. of Manipur (<http://cmhtmanipur.gov.in/>)
16. Govt. of Meghalaya (<https://mhis.org.in/>)
17. Govt. of Mizoram (<https://health.mizoram.gov.in/page/healthcare-scheme-chi-hnih-ab-pmjay-leh-mshcs>)
18. Govt. of Nagaland (<https://pmjay.gov.in/nagaland>)
19. Govt. of Sikkim ([https:// Sikkim.gov.in](https://Sikkim.gov.in))
20. Govt. of Tripura (<https://pmjay.gov.in/tripura>)
21. Report of National Cancer Registry Programme (ICMR-NCDIR), Bengaluru, India 2020.



The Way Forward

The report on cancer profile and related health indicators in India's Northeast Region provides a useful insight into the current cancer scenario and a roadmap to evaluate ongoing measures and plan for newer strategies for cancer control. The need of the hour is to strengthen health systems and cancer research in the region.

The following recommendations are categorized as (a) Strengthening of health systems (b) Measures for cancer prevention and control.

(a) Strengthening of health systems

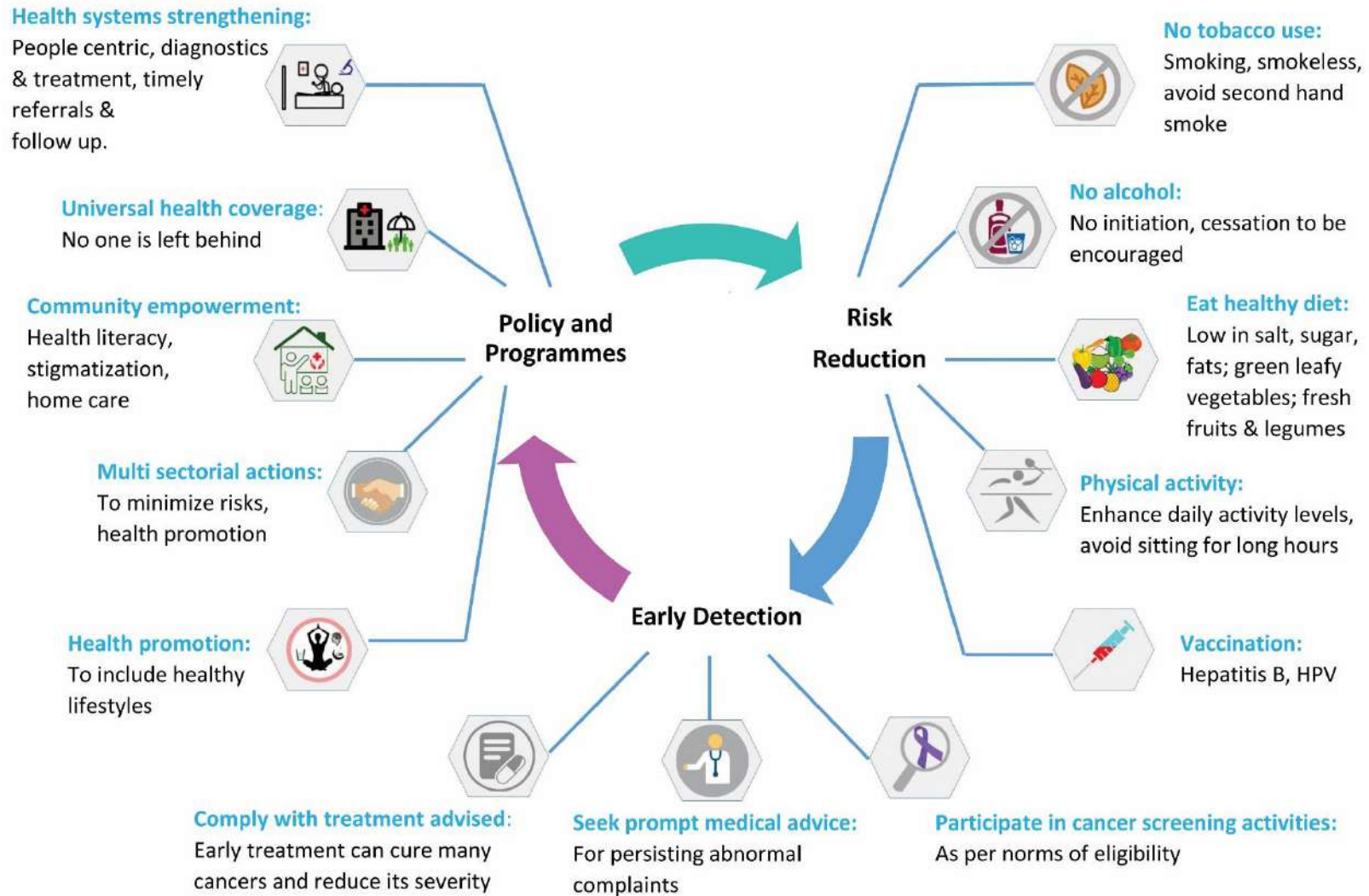
- Political will to increase public health expenditure, expand availability of cancer care services and health financing schemes.
- Capacity building of health care providers through regular training, re-training and skill enhancement for cancer care.
- Adopt and promote health technology for prevention and treatment such as use of digital tools for early detection and telemedicine for improved access to care.

(b) Measures for cancer prevention and control

- Implementation and scaling up of Information, Education and Communication (IEC) and Behavioural Change Communication (BCC) activities: Tobacco and alcohol use, unhealthy diet and physical inactivity. Such activities could be regional and culturally specific, making use of locally acceptable channels of communication.
- Periodic surveillance of behavioural and metabolic risk factors to measure the baseline prevalence and monitor change trends through regular surveys would be useful for tracking the impact of preventive measures.
- Strengthening of community-based tobacco and alcohol cessation services.
- Integrate cancer prevention with primary care and geriatric care by counselling for a healthy lifestyle.
- Scaling up and enhancing the availability and utilization of cancer screening and early detection services in the region.
- Facilitate early diagnosis by health education on warning signs and symptoms and train health care providers to recognize the same.
- Measures to ensure continuum of care.
- Better implementation of regional and state based cancer insurance programmes to improve accessibility and affordability of cancer care.
- Strengthening the medical certification of cause of death for availability of accurate and complete cancer mortality.
- Expansion of tertiary cancer care services
- Formulate follow up care programmes for cancer survivors to improve quality of life
- Implementation and promotion of community based palliative care.
- A prioritized cancer research agenda to address local and regional needs.



Ways for Cancer Prevention and Control





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1. Dibyendu Ash / Tawang Monastery / https://en.wikipedia.org/wiki/File:Tawang_Monastery_second_largest_monastery_in_Asia_Arunachal_Pradesh_India.jpg / CC BY 4.0
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3. Shantanu Kuveskar / Hornbill Bird / https://commons.wikimedia.org/wiki/File:Great_hornbill_PhotoGraph_by_Shantanu_Kuveskar.jpg / CC BY-SA 4.0
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6. Prashanthns – Nandini Velho / Nyokum festival of Nyishi tribe / https://en.wikipedia.org/wiki/Northeast_India#/media/File:Nyokum_festival_Nyishi.JPG / CC BY-SA 3.0
7. Kevin628 / arunachal pradesh dish / https://en.wikipedia.org/wiki/File:Red_Rice_With_Pork_pieces.jpg / CC BY-SA 4.0
8. Arunachal2009 Arif Siddiqui / Dancers from Tutsa sub tribe of Tangsa / https://en.wikipedia.org/wiki/Arunachal_Pradesh#/media/File:Tutsa_Dancers_from_Changlanga_District.jpg / CC BY-SA 3.0
9. Digantatalukdar / a father and son of aka tribe / https://en.wikipedia.org/wiki/File:Aka_Tribe.jpg / CC BY 3.0

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5. Diganta Talukdar / Adult rhinos with a calf / https://commons.wikimedia.org/wiki/File:Rhinos_in_KNP.jpg / CC BY-SA 4.0
6. Abhijit Saikia / Husori on Bohag Bihu / https://en.wikipedia.org/wiki/Assam#/media/File:A_group_of_'Husori'_for_the_occasion_of_Assamese_'Bohag_Bihu'_in_their_tradition_at_ahire.png / CC BY-SA 4.0
7. Diganta Talukdar / Bihu festival traditional attire / https://en.wikipedia.org/wiki/Assam#/media/File:Assamese_Bihu.jpg / CC BY-SA 4.0
8. Subhrajit / Satriya dance / https://en.wikipedia.org/wiki/File:Satriya_dance_at_Rabindra_Bhawan.JPG / CC BY-SA 3.0
9. GOSWAMI RANJIT / Assamese dish / https://commons.wikimedia.org/wiki/File:Assamese_dish.JPG / CC BY-SA 4.0

Manipur

1. Kingsubash11 / Nongyeen Mrs. Hume's pheasant / https://en.wikipedia.org/wiki/Manipur#/media/File:Nongyeen_Mrs._Hume's_pheasant.jpg / CC BY-SA 4.0
2. Dazious / Thang-Ta / <https://en.wikipedia.org/wiki/File:Thang-Ta.jpg> / PDM
3. Beejen / The Kangla Sha / <https://en.wikipedia.org/wiki/Manipur#/media/File:Kanglasha.jpg> / CC BY-SA 3.0
4. Kayia N / Kangla Fort / https://commons.wikimedia.org/wiki/File:Sanamahi_temple_inside_Kangla_Fort,_Imphal_East,_Manipur.jpg / CC BY-SA 4.0
5. Mongyamba / Cheiraoba / <https://en.wikipedia.org/wiki/Manipur#/media/File:Cheiraochingkaba.jpg> / CC BY-SA 3.0
6. Punshiba18 / Soibum yendem eromba / https://commons.wikimedia.org/wiki/File:Soibum_yendem_eromba.jpg / CC BY-SA 3.0
7. Raul654 / Cervus eldii / https://commons.wikimedia.org/wiki/File:Cervus_eldii4.jpg / CC BY-SA 3.0
8. Goumisao / Smoked freshwater fish / https://en.wikipedia.org/wiki/Northeast_India#/media/File:Smoked_freshwater_fish.JPG / CC BY-SA 3.0
9. Akkkanksha / Lai Harooba Manipur festival / https://en.wikipedia.org/wiki/File:Lai_harooba_manipur.JPG / CC BY-SA 3.0

Meghalaya

1. Sai Avinash / a road in Mawlynnong / https://en.wikipedia.org/wiki/Mawlynnong#/media/File:Street_in_Mawlynnong.jpg / CC BY-SA 4.0
2. ChanduBandi / Mawphlang dam reservoir / https://en.wikipedia.org/wiki/Meghalaya#/media/File:Mawphlang_Dam_Reservoir_Meghalaya_India.jpg / CC BY 2.0
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5. DiverDave / Common hill myna / https://en.wikipedia.org/wiki/Meghalaya#/media/File:Gracula_religiosa_robusta-01.JPG / CC BY-SA 4.0
6. Kunal Dalui / Nohkaiik Falls / https://en.wikipedia.org/wiki/Meghalaya#/media/File:Nohkaiik_Falls_Cherrapunji.JPG / CC BY-SA 3.0
7. Harikrishnan S / Root bridge in Nongriat / https://en.wikipedia.org/wiki/Meghalaya#/media/File:Living_root_bridge_HS.jpg / CC BY-SA 4.0
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9. Bipul Rabha / Wangala dance of Garo tribe / https://en.wikipedia.org/wiki/Northeast_India#/media/File:Wangala_Dance_1.JPG / CC BY-SA 3.0

Mizoram

1. Melanochromis / A serow / https://commons.wikimedia.org/wiki/File:Serow_Capricornis_sumatraensis.JPG / PDM
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7. Ministry of Information and Broadcasting / Mizoram Bango Nirtya / [https://en.wikipedia.org/wiki/File:Mizoram_Bango_Nirtya_performed_at_the_44th_India_International_Film_Festival_of_India_\(IFFI-2013\)_in_Panaji_Goa_on_November_26_2013.jpg](https://en.wikipedia.org/wiki/File:Mizoram_Bango_Nirtya_performed_at_the_44th_India_International_Film_Festival_of_India_(IFFI-2013)_in_Panaji_Goa_on_November_26_2013.jpg) / GODL-India
8. Ezralaisim10 / a traditional musical instrument of biate tribe / <https://en.wikipedia.org/wiki/File:Zamluang.jpg> / CC BY-SA 3.0
9. Jhmar13 / Solomon's Temple / https://en.wikipedia.org/wiki/File:Solomon%27s_Temple_on_a_cloudy_day.jpg / CC BY-SA 4.0

Nagaland

1. Kaushik Mishra / traditional attire / https://en.wikipedia.org/wiki/File:A_couple_in_traditional_attire.jpg / CC BY-SA 4.0
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7. Unknown Author / Dancer from Naga tribe of Zeliangrong / https://en.wikipedia.org/wiki/File:Танцор_племени_нага.JPG / PDM
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9. Yves Picq / Festival of angami tribe / https://en.wikipedia.org/wiki/File:Angami_1863b.jpg / CC BY-SA 3.0

Sikkim

1. Sukanto Debnath / A little girl from Kaluk Bazaar / https://en.wikipedia.org/wiki/File:Flickr_-_Sukanto_Debnath_-_A_little_girl_from_Kaluk_Bazaar.jpg / CC BY 2.0
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8. <https://www.namasteindiatrip.com/traditional-dress-of-sikkim.html>
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Tripura

1. Augustus Binu / Durga Puja / https://upload.wikimedia.org/wikipedia/commons/2/2f/Durga_Puja_DS.jpg / CC BY-SA 3.0
2. <https://biodiversity.tripura.gov.in/fauna>
3. Mannamajumder / Bhanguis – Ethnic Food of Tripura-India / <https://en.wikipedia.org/wiki/File:Bhanguis.PNG> / CC BY-SA 4.0
4. Barungshou / Igneous rock wall and images / https://en.wikipedia.org/wiki/File:Unakoti_3.jpg / CC BY-SA 4.0
5. Babulmiah12 / Neermahal place of water / <https://commons.wikimedia.org/wiki/File:Neer-Mahal.jpg> / CC BY-SA 4.0
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8. NABATIZER / Tripura Forest / https://commons.wikimedia.org/wiki/File:Forests_invoking_to_be_explored.JPG / CC BY-SA 4.0
9. Cecilia Debbarma / This photo was clicked on ethnic day in office / https://en.wikipedia.org/wiki/File:Traditional_dress_of_Tripura.jpg / CC BY-SA 3.0



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