

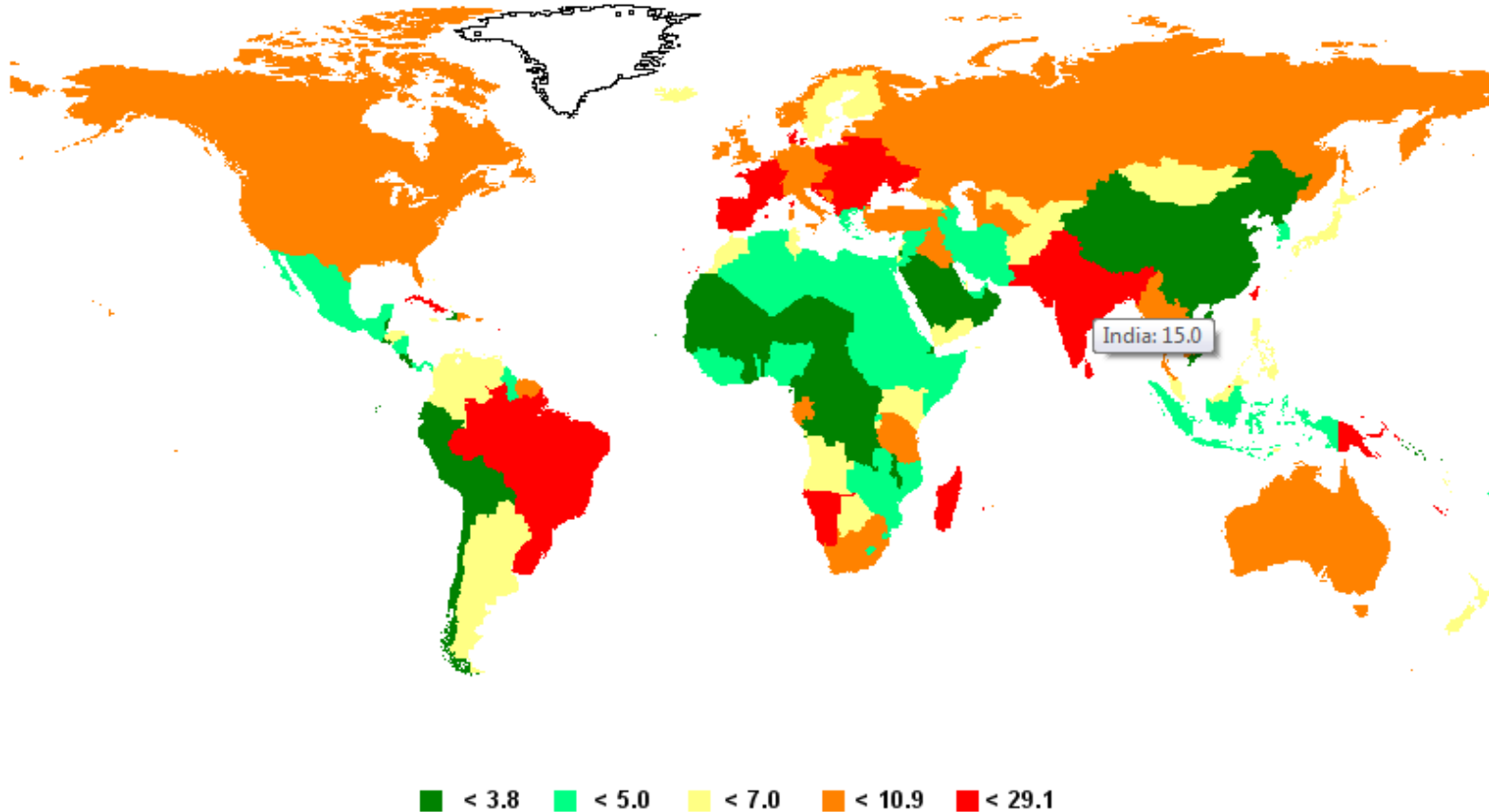
Head & Neck Cancer: The Current Scenario and Epidemiology

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Estimated age-standardised incidence rate per 100,000
Lip, oral cavity, Larynx, Other pharynx: both sexes, all ages



6.4 lakh H & N Ca diag worldwide/yr
1.5 lakh India/year ~20 %



About Cancer Registry in India

- The National Cancer Registry Programme (NCRP) was commenced by the Indian Council of Medical Research (ICMR) with a network of cancer registries across the country in December 1981.
- Population based cancer registries record all the new cancer cases occurring in a defined geographic area, with epidemiological and public health aspects in mind.

Source: www.ncrpindia.org



- The hospital based cancer registries record information on cancer patients attending a particular hospital, with focus on clinical care and hospital administration.
- At present, there are 23 PBCRs and 7 HBCRs under the NCRP network.



Table 9.1: Number (#) and Proportion (%) of Head and Neck Cancers Relative to All Sites of Cancer (2007-2011)

Registry	Males			Females		
	All Sites	#	%	All Sites	#	%
Mumbai	22580	6805	30.1	18528	1673	9.0
Bangalore	11273	3532	31.3	13125	1822	13.9
Chennai	15731	4427	28.1	17499	1832	10.5
Thi'puram	19219	4798	25.0	18809	1726	9.2
Dibrugarh	2895	1211	41.8	2276	329	14.5
Guwahati	6803	2830	41.6	4679	702	15.0
Chandigarh	2643	598	22.6	2092	100	4.8
Total	81144	24201	29.8	77008	8184	10.6

- Report from Hospital Based Cancer Registries
Source: ncrpindia.org



Table 9.3: Number (#) and Relative Proportion (%) of Specific Head and Neck Sites Relative to All Head and Neck Cancers (2007-2011)

Sites of Cancer	Mumbai		Bangalore		Chennai		Thi'puram		Dibrugarh		Guwahati		Chandigarh	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
MALES														
Tongue	1603	23.6	754	21.3	1061	24.0	1214	25.3	164	13.5	472	16.7	192	32.1
Mouth	2776	40.8	731	20.7	1351	30.5	1593	33.2	257	21.2	545	19.3	94	15.7
Nasopharynx	172	2.5	61	1.7	155	3.5	127	2.6	31	2.6	75	2.7	27	4.5
Other Pharynx	1413	20.8	1539	43.6	1261	28.5	1098	22.9	653	53.9	1356	47.9	145	24.2
Larynx	841	12.4	447	12.7	599	13.5	766	16.0	106	8.8	382	13.5	140	23.4
Head and Neck	6805	100.0	3532	100.0	4427	100.0	4798	100.0	1211	100.0	2830	100.0	598	100.0



Fig. 9.2: Stack (100%) Diagram Showing Proportion (%) of Specific Head and Neck Cancer Sites Relative to All Head and Neck Cancers (2007-2011)

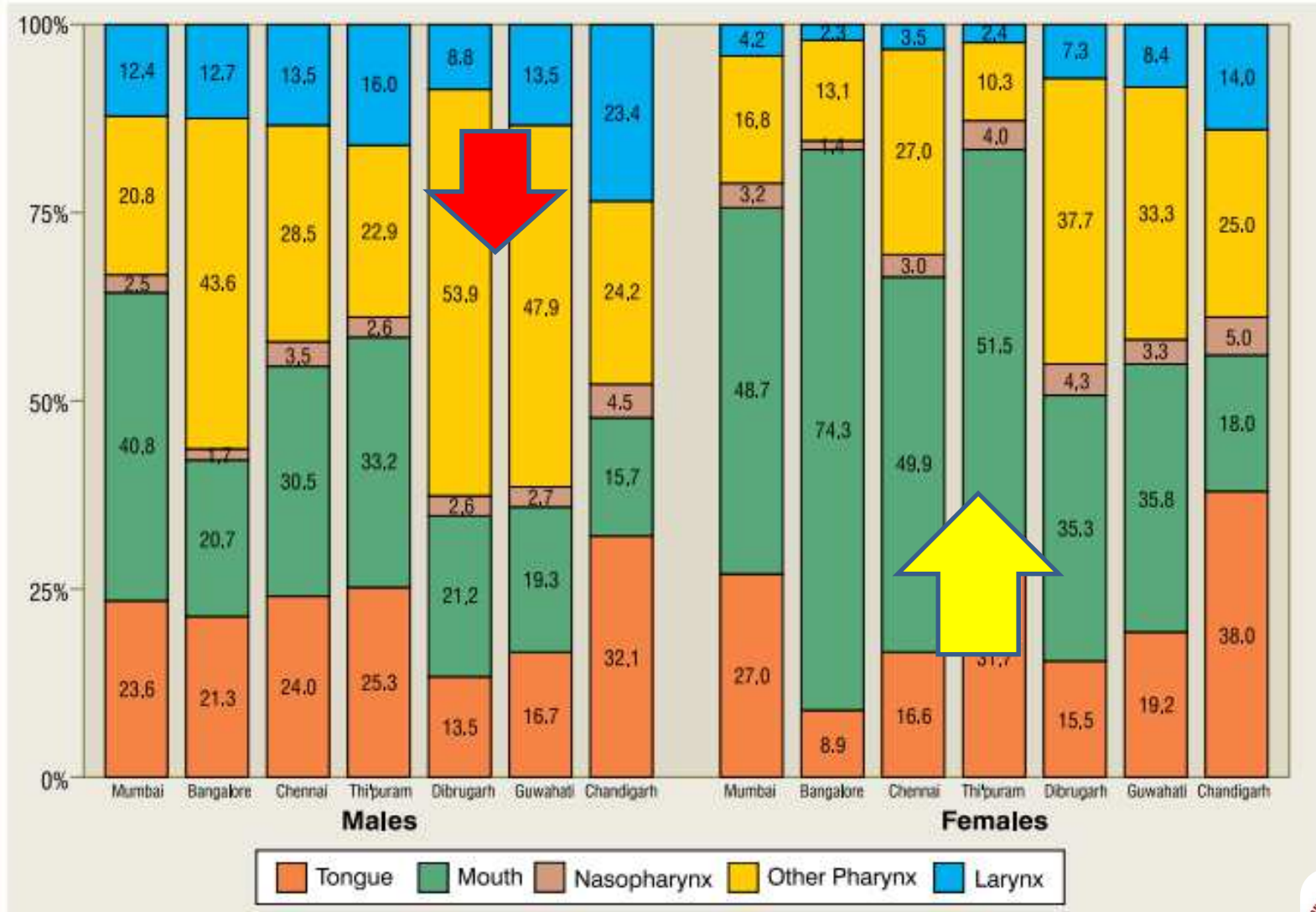
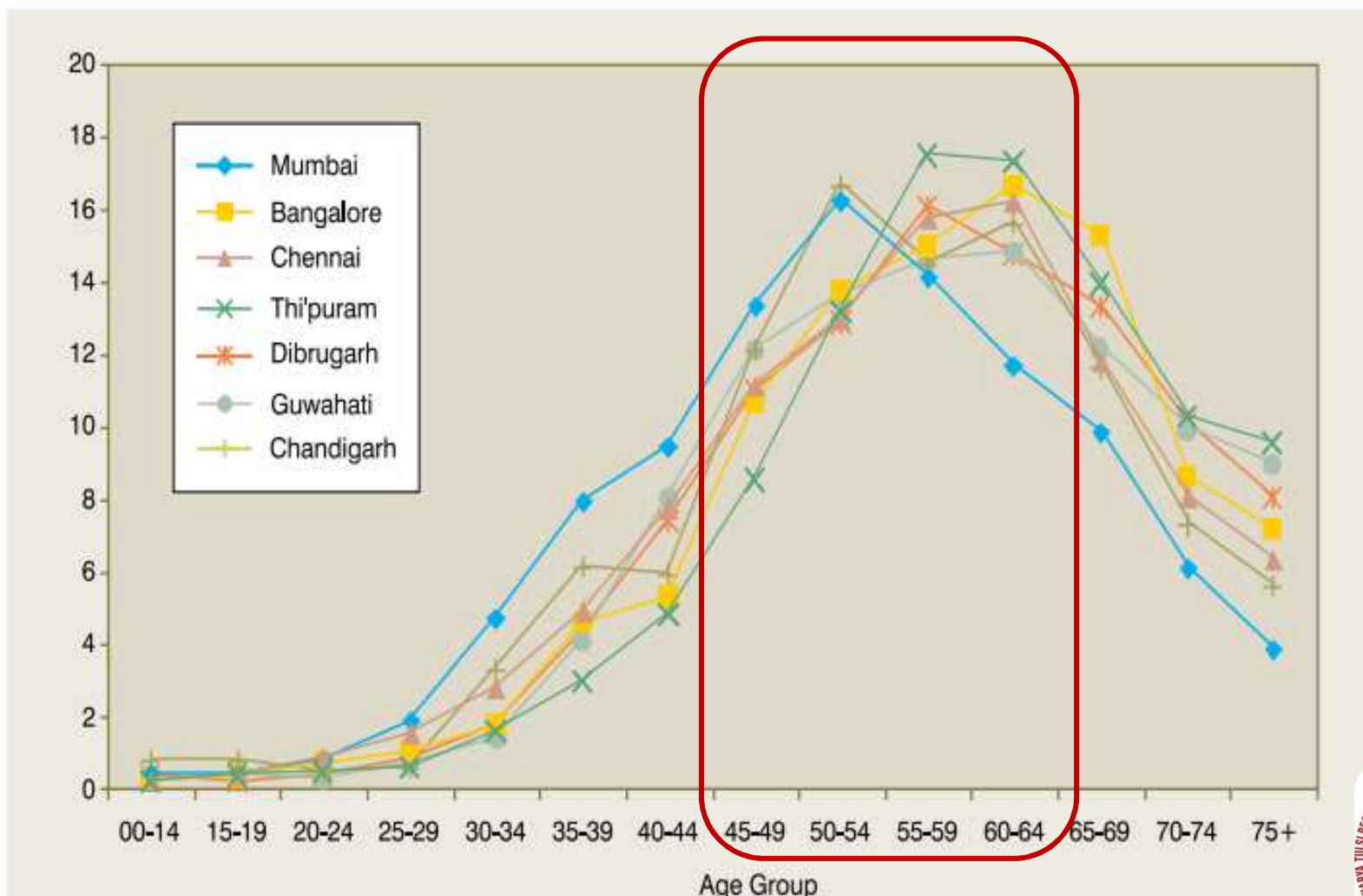


Fig. 9.3: Relative Proportion (%) of Head and Neck Cancers by Five-Year Age Group (2007-2011)

Males



Cancer Burden ahead

**Table 5.1(b): Projected Cases at India level for Selected Sites and Selected Time Periods
(2013, 2014, 2015 and 2020)**

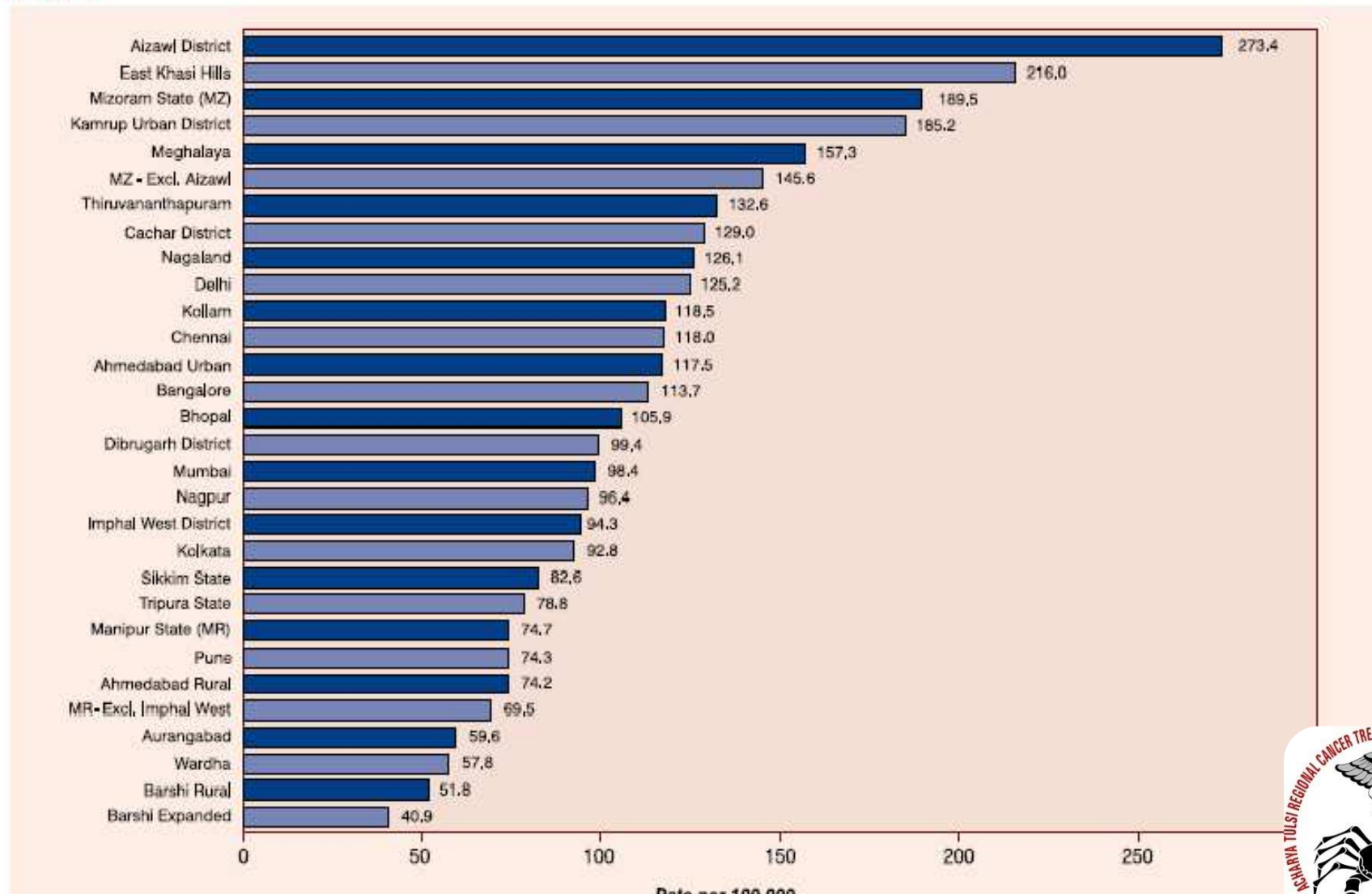
Both Sexes

		1,26,304	1,68,637		
ICD-10	Site Name	2013	2014	2015	2020
C00-C96	All Sites	1086783	1117269	1148692	1320928
C01-02	Tongue	44449	46614	48888	62099
C03-06	Mouth	63627	66836	70228	90342
C12-13	Hypopharynx	16238	16224	16213	16196
C15	Oesophagus	37909	37623	37344	36058
C16	Stomach	35531	36176	36837	40419
C18	Colon	28883	30312	31816	40601
C19-20	Rectum	27960	29173	30442	37720
C22	Liver	26738	27781	28866	35003



**Fig. 7.1: Comparison of Age Adjusted Incidence Rates (AARs) of all PBCRs
ALL SITES (ICD-10: C00-C97)**

Males



TOP TEN CANCERS: MALE

MALE						
Bangalore	Barshi	Bhopal	Chennai	Delhi	Mumbai	Ahmedabad
Stomach(9.3)	Hypopharynx(3.8)	Lung(10.1)	Lung(12.4)	Lung(13.5)	Lung(8.7)	Mouth(6.9)
Lung(8.5)	Esophagus(2.6)	Mouth(8.8)	Stomach(11.9)	Prostate(10.4)	Mouth(6.8)	Tongue(7.0)
Esophagus(7.0)	Larynx(2.8)	Tongue(8.9)	Esophagus(7.9)	Larynx(8.5)	Prostate(6.8)	Lung(6.6)
Prostate(6.8)	Mouth(3.4)	Esophagus(5.4)	Mouth(6.3)	Tongue(6.6)	Larynx(5.5)	Hypopharynx(5.3)
Brain(3.9)	Stomach(2.6)	Larynx(4.7)	Tongue(5.7)	NHL(5.4)	Esophagus(5.5)	Esophagus(3.3)
NHL(4.1)	Prostate(1.6)	Prostate(4.7)	Larynx(4.9)	Bladder(6.5)	Tongue(4.8)	Larynx(2.7)
Liver(4.4)	Penis(2.0)	Hypopharynx(4.1)	Prostate(5.0)	Mouth(5.5)	NHL(4.4)	Myel Leuk(1.8)
Hypopharynx(3.9)	Oth Skin(1.6)	NHL(3.2)	NHL(4.1)	Brain(4.2)	Stomach(4.9)	Tonsil(1.9)
Larynx (3.8)	Tongue(1.9)	Liver (2.5)	Hypopharynx(4.5)	Esophagus(5.1)	Liver(4.6)	Brain(1.5)
Colon (3.2)	NHL(1.9)	Myel Leuk(1.9)	Rectum(3.7)	Stomach(3.5)	Brain(3.1)	Prostate(1.7)



TOP TEN CANCERS: FEMALE

FEMALE						
Bangalore	Barshi	Bhopal	Chennai	Delhi	Mumbai	Ahmedabad
Breast(30.9)	Cervix(22.8)	Breast(24.6)	Breast(33.0)	Breast(31.4)	Breast(29.3)	Breast(9.2)
Cervix (18.8)	Breast(9.4)	Cervix(17.7)	Cervix (22.3)	Cervix (17.4)	Cervix(13.4)	Cervix (7.9)
Ovary(6.2)	Esophagus(4.0)	Ovary(6.5)	Stomach(5.6)	Ovary(8.3)	Ovary(6.5)	Ovary(3.4)
Esophagus(6.5)	Ovary(3.8)	Gall bladder(4.3)	Ovary(5.4)	Gall bladder(7.4)	Esophagus(3.7)	Esophagus(1.7)
Mouth(5.9)	Lung(2.5)	Esophagus(4.2)	Esophagus(5.0)	Corpus uteri(4.4)	Mouth(3.5)	Mouth(1.6)
Stomach(4.9)	Rectum(0.7)	Mouth(3.7)	Mouth(4.7)	Lung(3.5)	Lung(3.0)	Myeloid Leukemia(1.0)
Corpus uteri(4.3)	Oth Skin(1.1)	Brain(1.9)	Thyroid(2.9)	NHL(2.9)	NHL(2.7)	Rectum(0.9)
NHL(3.5)	Mye Leuk(0.9)	Myeloid Leukemia(2.2)	Lung(3.0)	Brain (2.6)	Corpus uteri(2.8)	Vulva(0.8)
Thyroid(2.9)	Corpus Uteri(0.9)	Corpus Uteri(2.3)	Brain(2.2)	Thyroid(2.6)	Gall bladder(2.6)	Bone(0.7)
Lung(3.0)	Liver(0.8)	Lung(2.1)	Corpus Uteri(2.3)	Esophagus(3.1)	Stomach(2.4)	Brain (



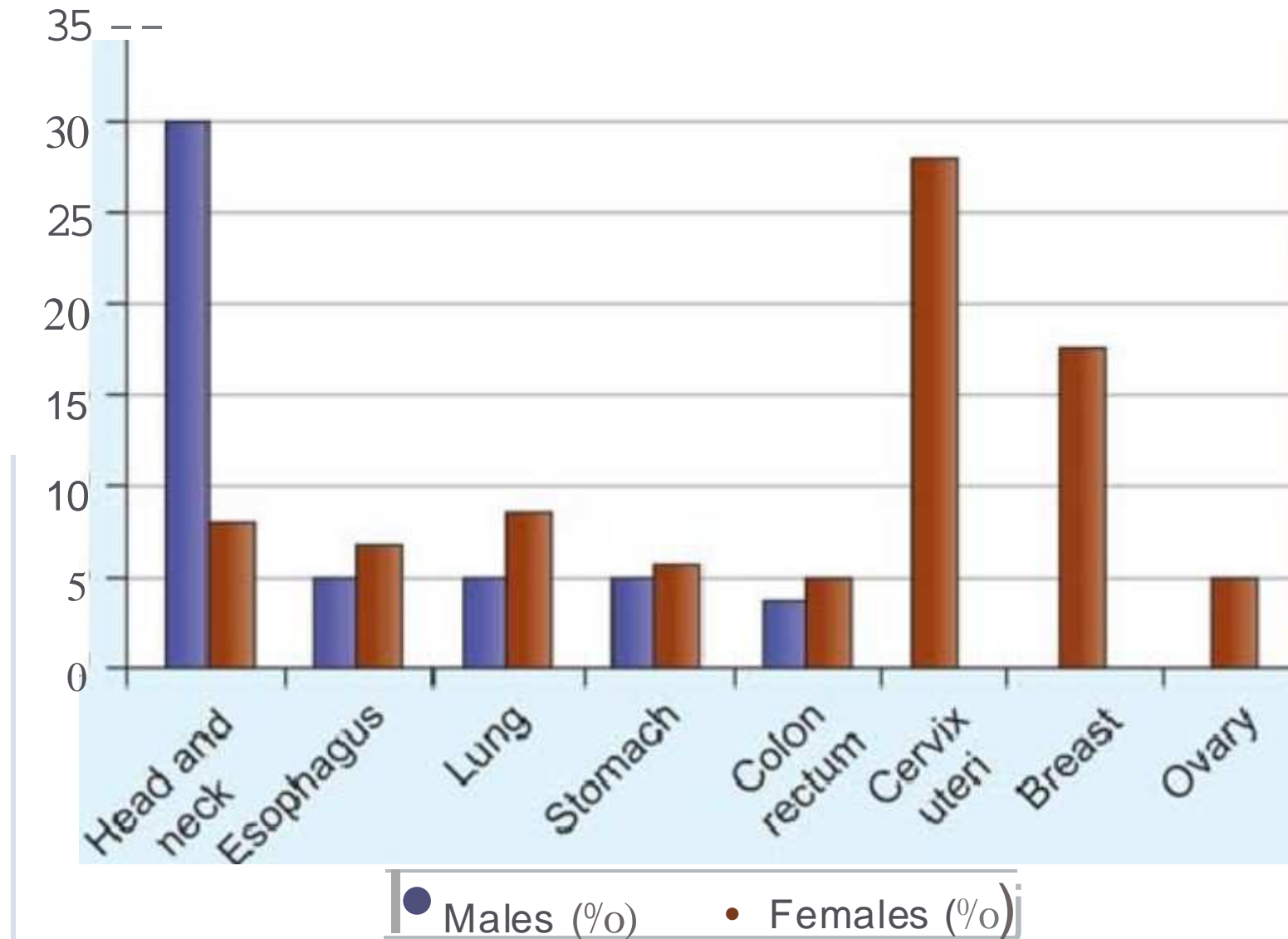


Fig. 1: Top cancers in India in both sexes^{8 25}



H & N Cancer: Presentation

Stage ¹	Rate(%)	TNM ²	Rate(%)
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At Presentation

Early (I--II)	15--30	T1--2	20
LA (III--IV)	60--80	T3--4	80
Metastatic	2--15	N0--1	54

Post--therapy

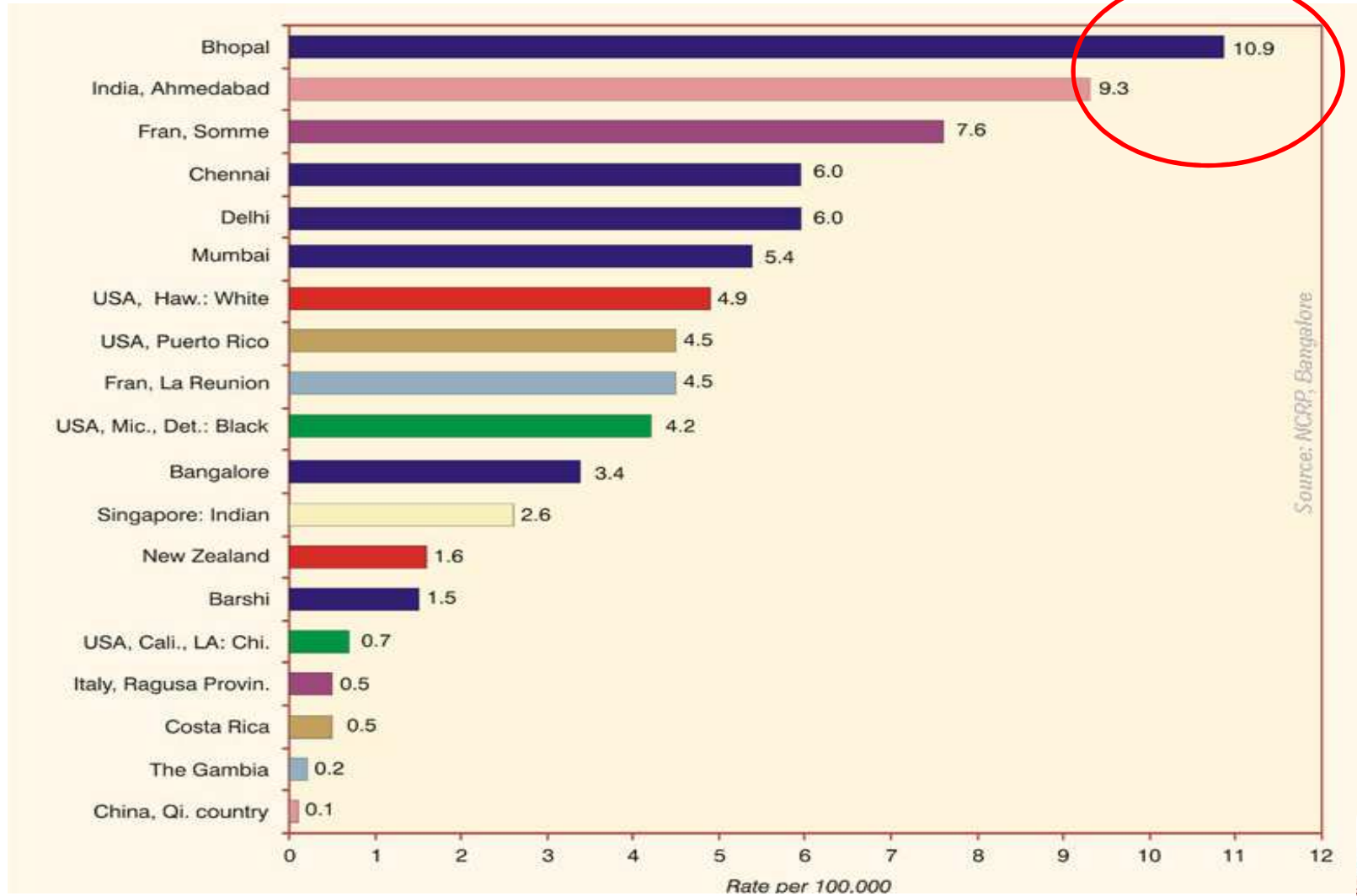
Dist Mets (+SMN)	15--30	N2--3	46
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1. *Choong N. CA 2008;58:32-53.*
2. *AIIMS data. JLO 2007; 121:49-56.*

Usual age of diagnosis: after 40 years, except for salivary gland and nasopharyngeal cancers (younger age).



International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP TONGUE (ICD-10 : C01-C02) - Males



- Source: Cancer Atlas (www.canceratlasindia.org)



Risk Factors

- Tobacco use
- Alcohol
- The effects of alcohol and tobacco may be synergistic.
- HNC patients: increased risk for second primary tumor (SPT), both within the head and neck and elsewhere (e.g., esophageal and lung cancers), known as field cancerisation.
- Occupational exposures to wood and leather dust: Sinonasal tract tumors.



Clinical Presentation

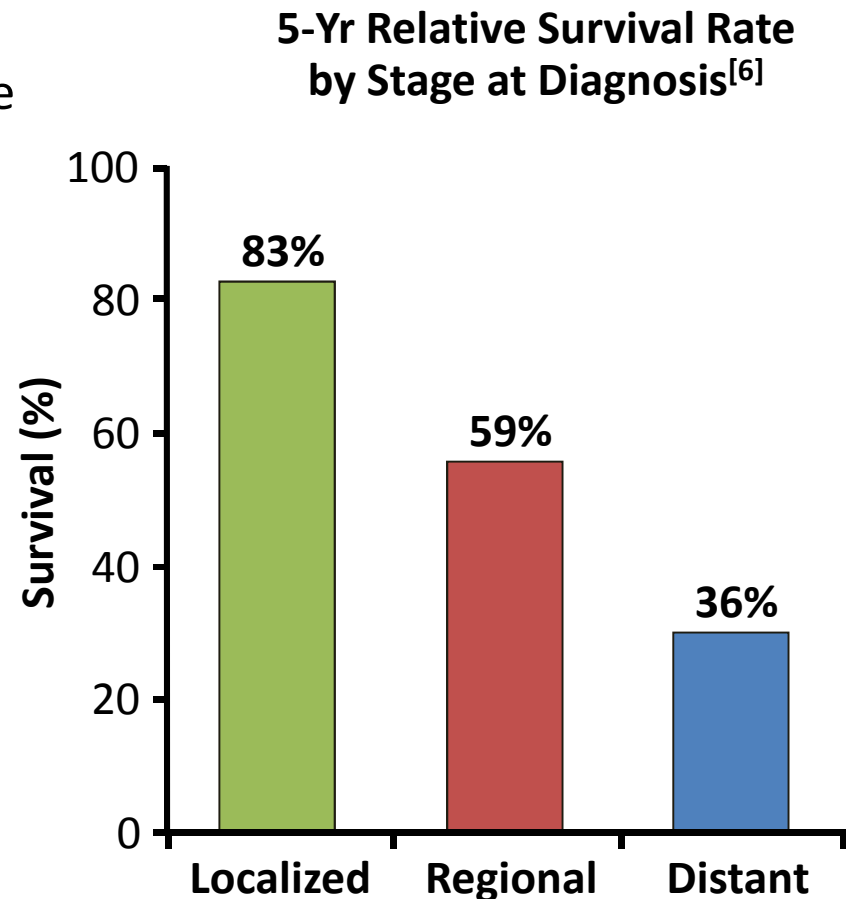
- Persistent hoarseness
- Palpable mass in neck
 - Branchial cleft cysts rarely present later than young adulthood
 - Neck mass in persons older than 40 yrs of age should be considered a malignancy until proven otherwise
- Ear infection or pain
- Altered oral sensations or persistent sore throat
- Lesions in mouth
 - Erythroplasia (early red lesions)
 - Leukoplakia (white lesions)
 - Persistent mass or ulcer (usually oral cavity)
- Difficulties in chewing, swallowing, or moving the tongue or jaws

Evaluation

- Inspection and palpation
- Biopsy of any suspicious mucosal surface
- Imaging
 - CT, MRI
 - PET/CT of value in identifying neck disease and unknown primaries
 - CT of chest if there are neck nodes and no PET/CT as lung metastases common first distant site
 - New cystic lesion in the neck unlikely to be recent onset branchial cleft cyst in an adult
- FNA of lymph node
- Examination under anesthesia
 - Full evaluation of the areas at risk

HNSCC: Survival Rates by Stage of Disease

- High cures rates are achieved for localized and loco-regional disease using:
 - Surgery
 - Radiation
 - Chemoradiation
 - ± Induction chemotherapy
- Survival rates for recurrent/metastatic disease remain very poor
- Better treatment options are necessary



Level of Evidence for Smoking-Attributable Cancers According to the United States Office of the Surgeon General by Cancer Site and Yearly Smoking-Attributable Mortality at Sites with Available Estimates, United States, 2004

	Cancer Site	Yearly Smoking-Attributable Mortality
Evidence Sufficient to Infer Causal Relationship	Bladder	4,983
	Cervix	447
	Colon and rectum	N/A
	Esophagus	8,592
	Kidney	3,043
	Larynx	3,009
	Leukemia (AML)	1,192
	Liver	N/A
	Lung	125,522
	Oral cavity and pharynx	4,893
Evidence Suggestive but Not Sufficient to Infer Causal Relationship	Breast	
Inadequate to Infer Presence or Absence of Causal Relationship	Ovary	
Evidence Sufficient to Infer No Causal Relationship	Prostate	



Oncogenic Viruses

- HPV (most commonly HPV-16) particularly in the oropharynx.
- tend to be younger
- less likely to have a strong history of tobacco and ethanol use,
- history of multiple sex partners,
- have a better prognosis, and
- appear to have a lower rate of SPTs.
- Association between **Epstein-Barr virus** and NPC.



Metabolism of Tobacco

- Nicotine is metabolized primarily to cotinine, which is further metabolized to trans-3'-hydroxycotinine (3HC), catalyzed by the liver cytochrome P450 2A6.



Smoking & Tar

- Historically, tar was believed to be the main contributor to smoking-caused disease.
- *Tar is not a specific substance, but simply the collected particulate matter from cigarette smoke, less water and nicotine.*



Pooled OR for chewing tobacco and risk of oral cancer = 4.7 [3.1–7.1]

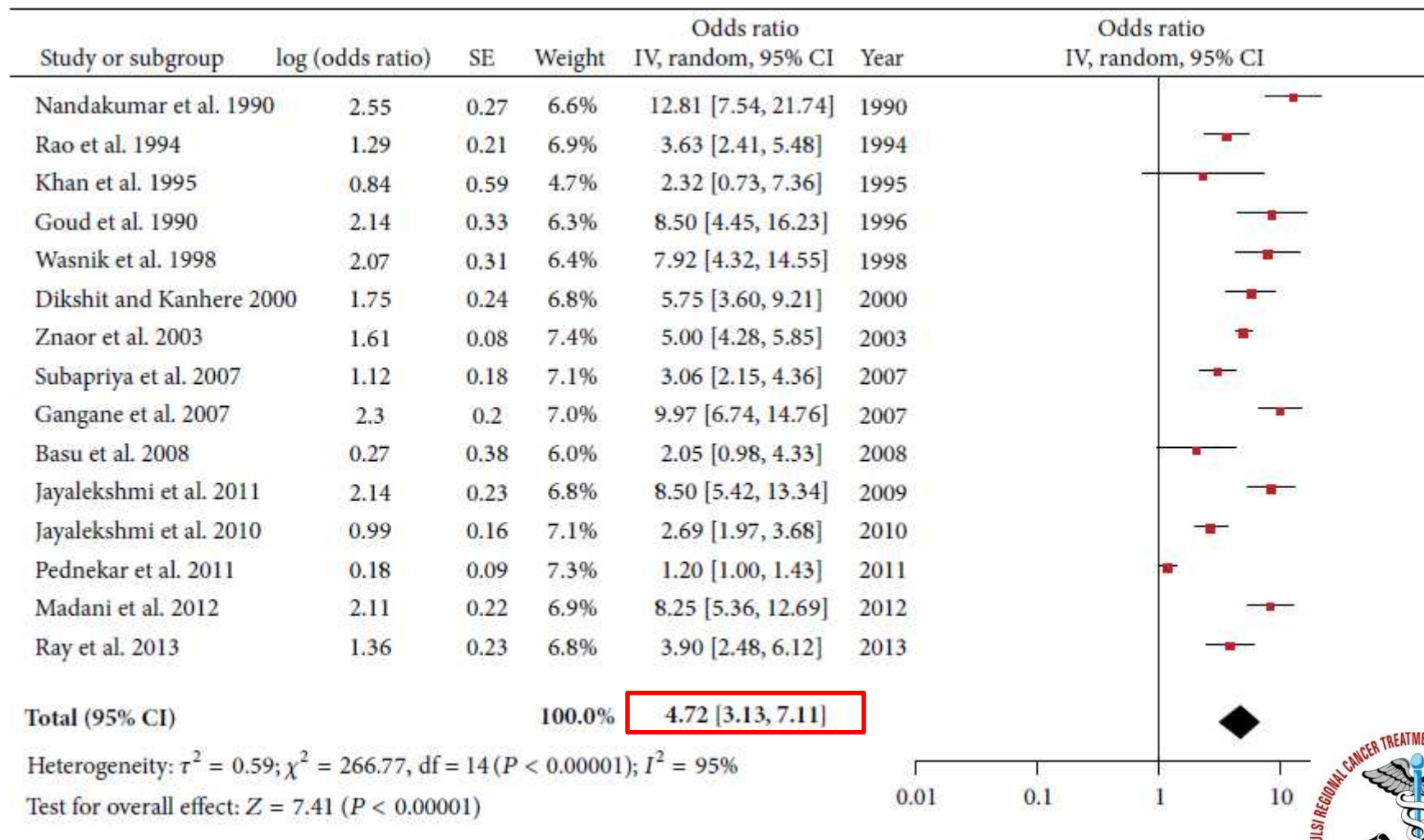


FIGURE 2: Forest plot of chewing tobacco and risk of oral cancer.



Carcinogenic Agents in Smokeless Tobacco

- *N-nitrosamines*
- Benzene,
- 1,3-butadiene,
- Aromatic amines,
- Cadmium



A dose of 10 gms of chewing tobacco for about 26 years was observed to have produced cancerous lesions in the buccal cavity.

Eur J Epidemiol. 1990 Jun;6(2):219-22.

Epidemiological correlates between consumption of Indian chewing tobacco and oral cancer.

Goud ML¹, Mohapatra SC, Mohapatra P, Gaur SD, Pant GC, Knanna MN.

⊕ Author information

Abstract

The problem of cancer is universal; the only variation occurs in the type, site or other clinicoepidemiological parameters. Peculiarly enough, oral cancers caused by chewing tobacco are common in India and some parts of the Indian sub-continent. Oral cancers caused by other carcinogens are not common in these areas. The present study shows a significant association (P less than 0.001) between the use of Indian chewing tobacco and oral cancer. Number of quids, mean quantity of tobacco and mean duration of keeping the quids in the mouth had direct dose and effect relationships in causation of oral cancer. A dose of 10 gms of chewing tobacco for about 26 years was observed to have produced cancerous lesions in the buccal cavity.



Pooled OR for Paan with tobacco and risk of oral cancer = 7.1 [4.5–11.1]

Journal of Cancer Epidemiol

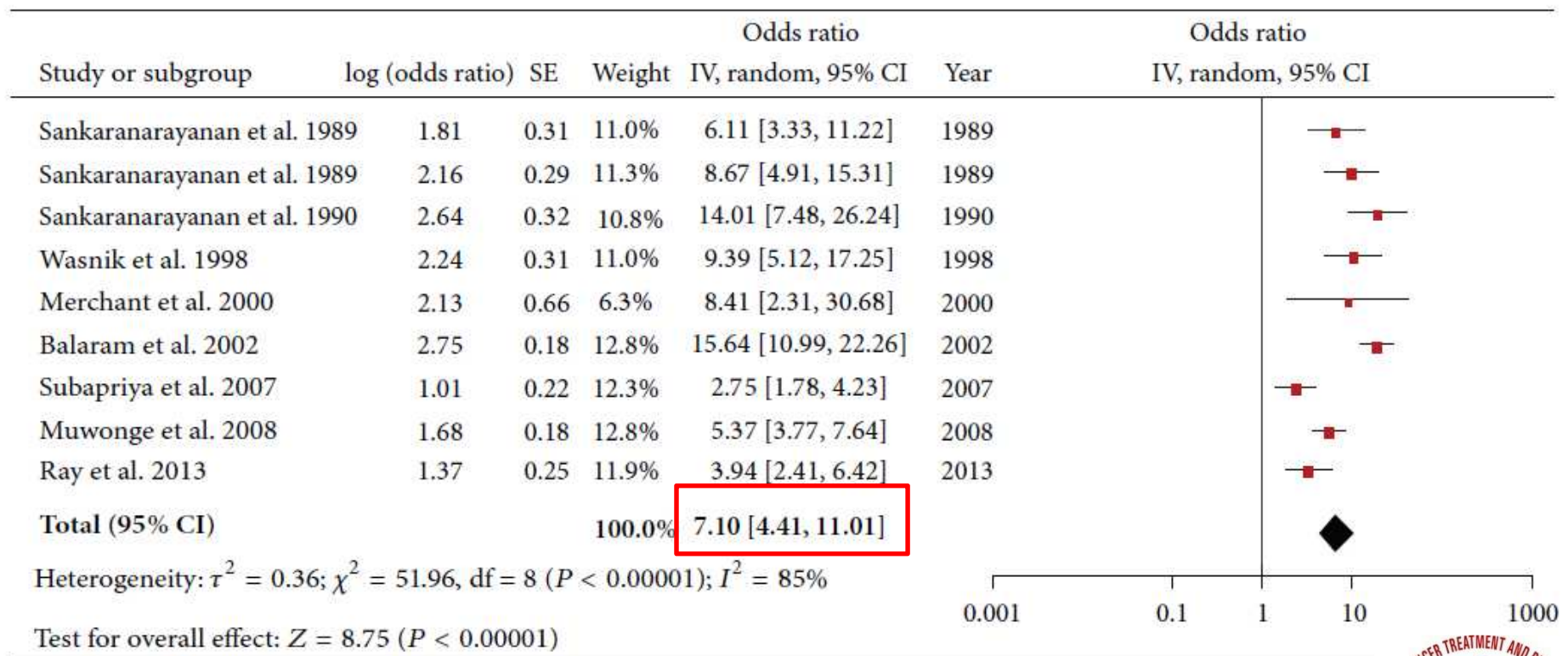


FIGURE 3: Forest plot of betel quid plus tobacco and the risk of oral cancer.

Ref: Zohaib Khan, et al. Smokeless Tobacco and Oral Cancer in South Asia: A Systematic Review with Meta-Analysis, Journal of Cancer Epidemiology, vol. 2014.



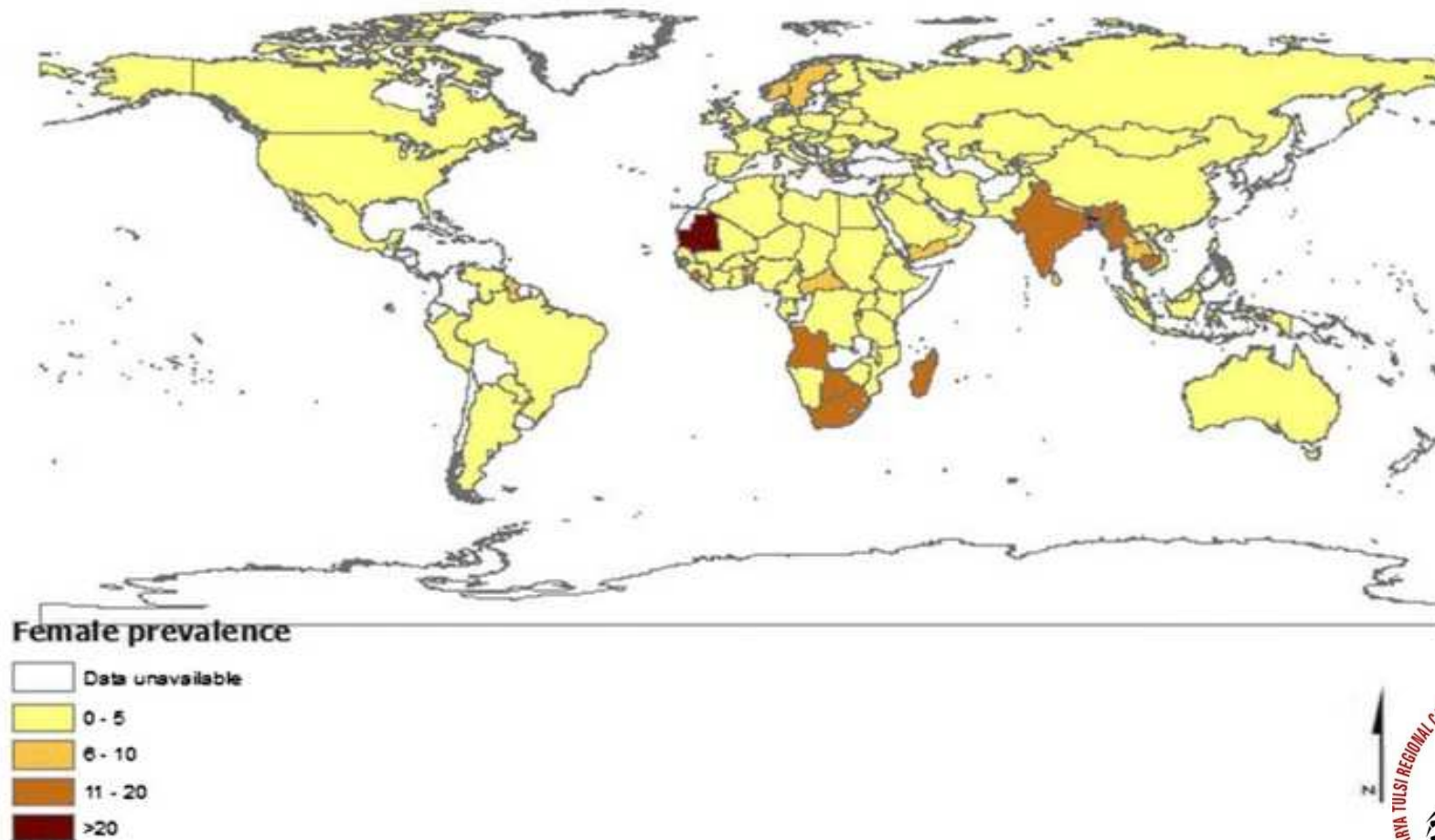
Hazard of **Pan with Tobacco**

- **Slaked lime**: carcinogenic potential.
- Facilitates the production of reactive oxygen species in the saliva of chewers
- Also facilitates the hydrolysis of **arecoline into arecaidine** which in turn facilitates increased fibroblast proliferation and collagen synthesis, which are essential for premalignant changes.
- **Areca nut** in paan: carcinogenic properties



An Important Point: SLT Use in Women

Global Prevalence of Smokeless Tobacco Use



Report of GATS 2010



USE OF SMOKELESS TOBACCO IN INDIA (percentage of adults age 15 and above)



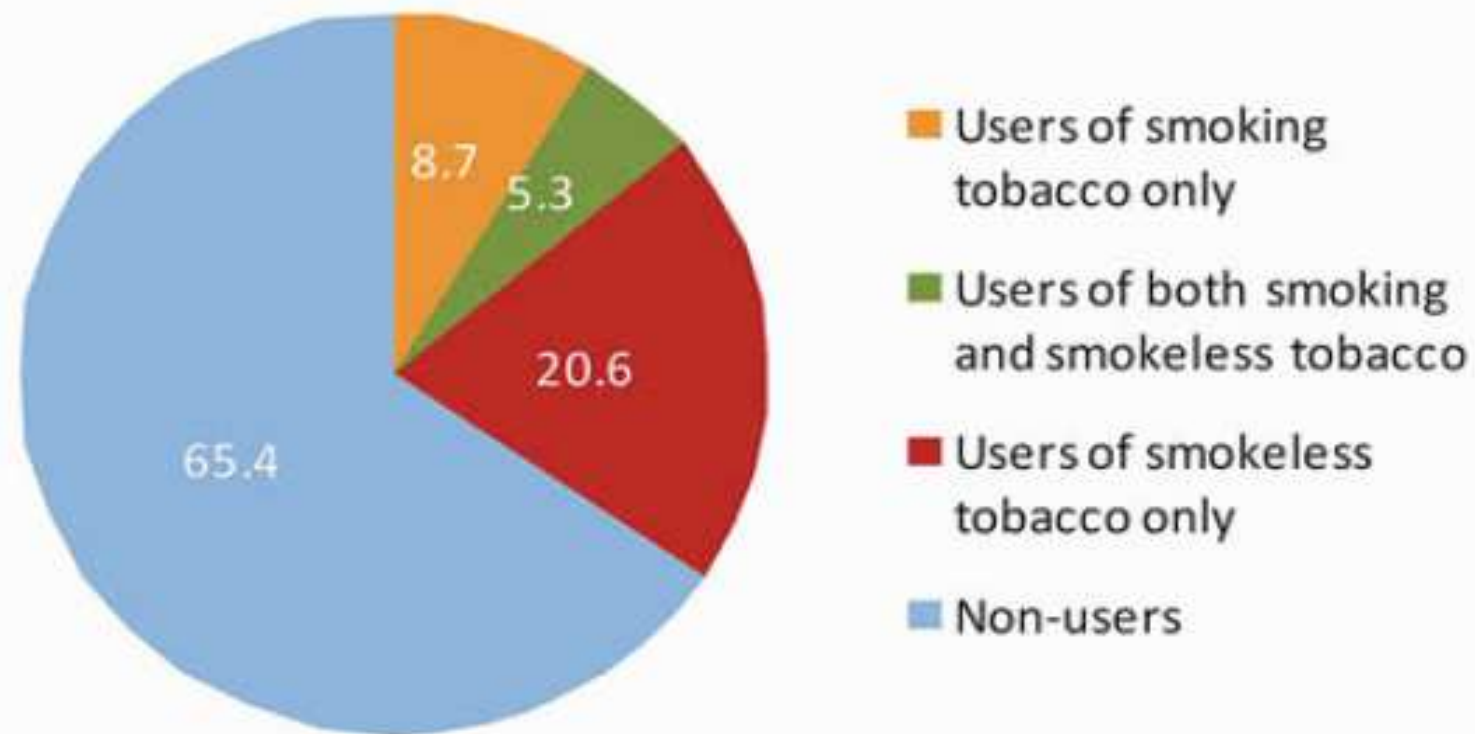
सत्यमेव जयते

Ministry of Health and Family Welfare
Government of India

Global Adult Tobacco Survey
(GATS)

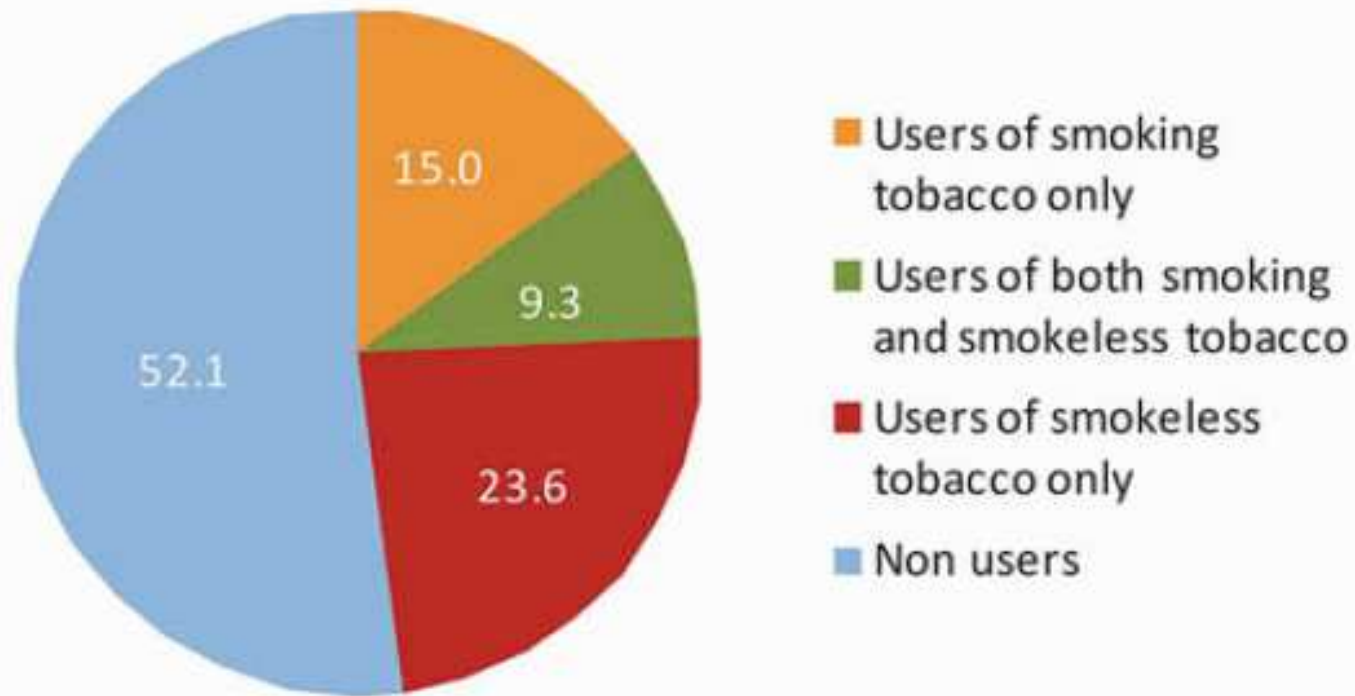
India: 34.6% adults consume Tobacco

Percent distribution of adult population by type of tobacco use



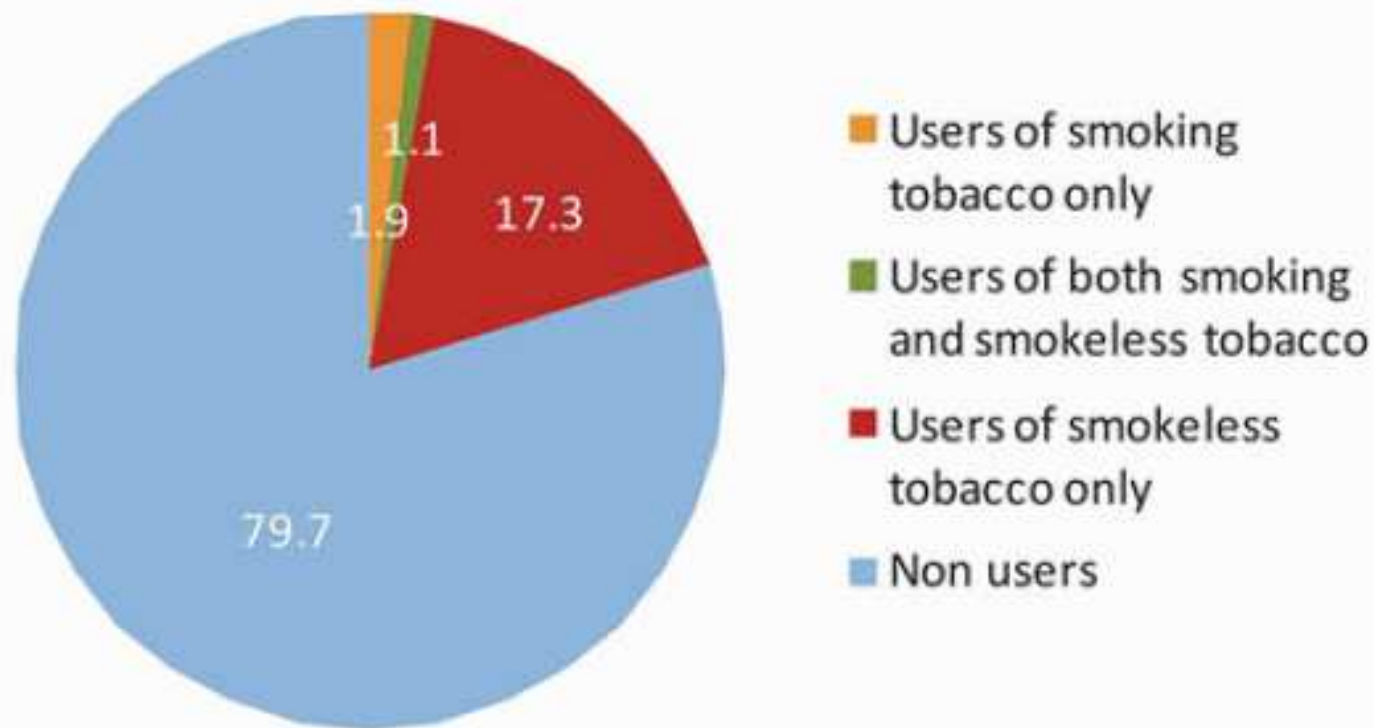
India: 47.9% males consume Tobacco

Percent distribution of adult males by type of tobacco use

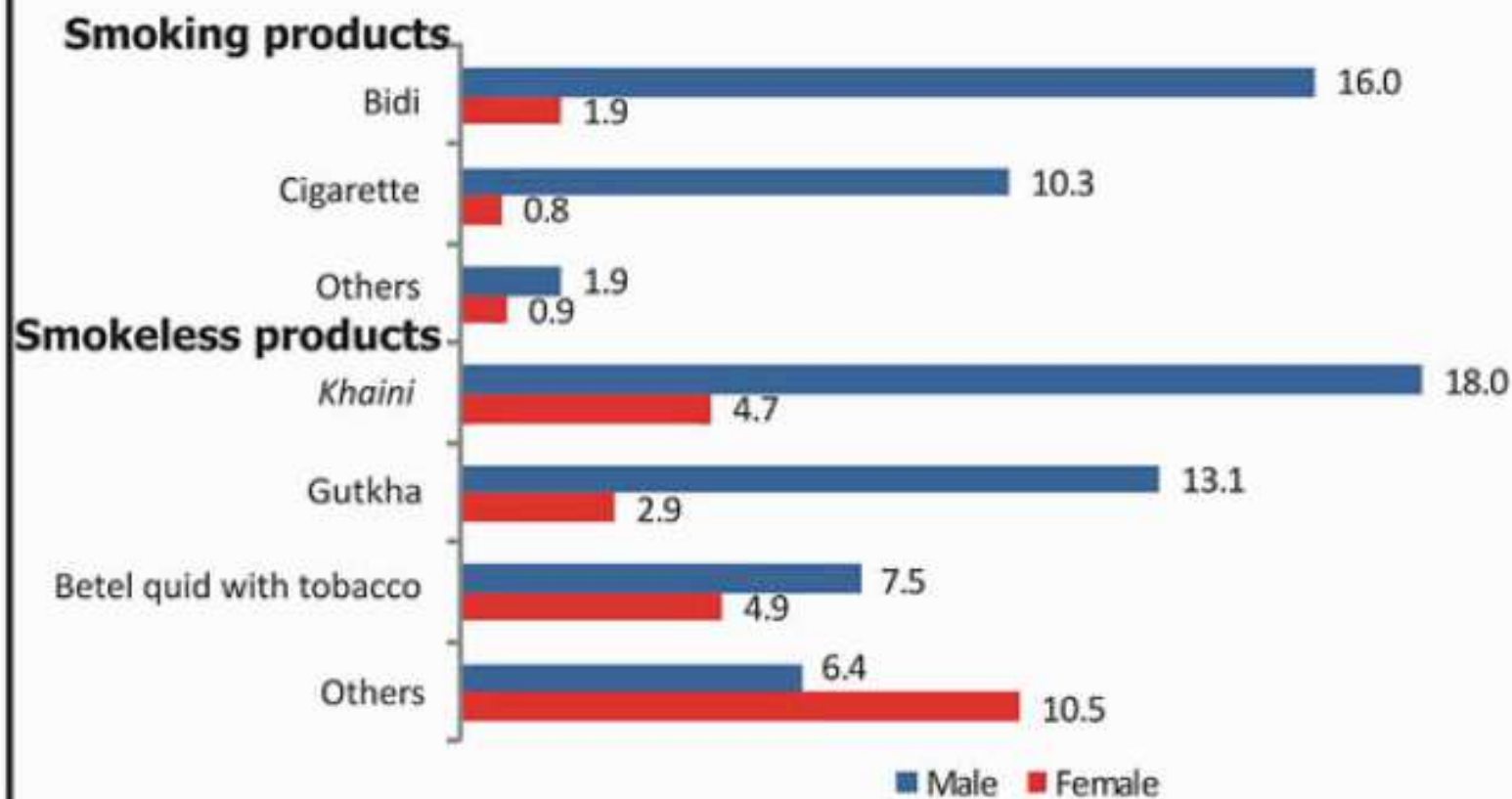


India: 20.3% females consume Tobacco

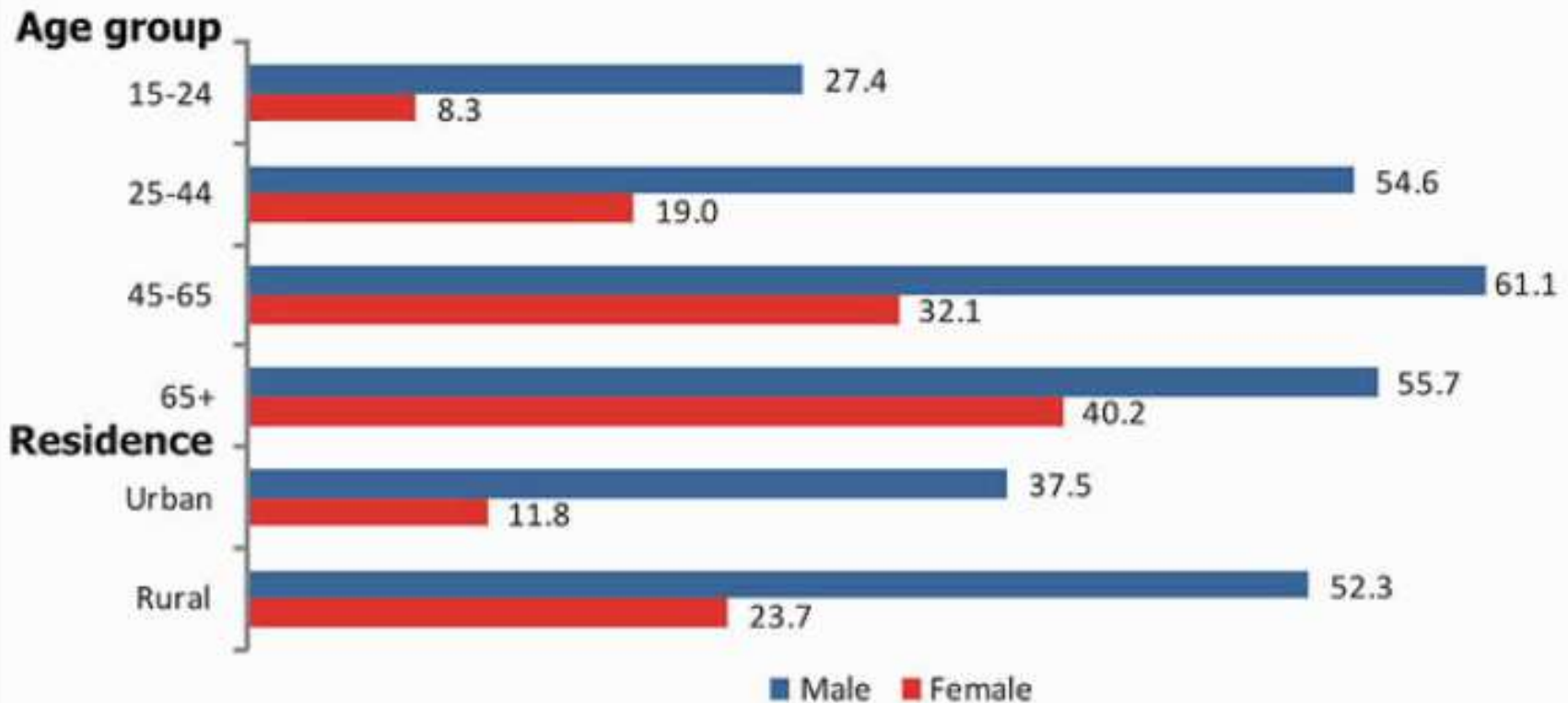
Percent distribution of adult females by type of tobacco use



Types of smoking and smokeless tobacco products use by gender (Percentage of adults age 15 and above)



Tobacco use by age, residence and gender (Percentage of adults age 15 and above)



Policy Implications

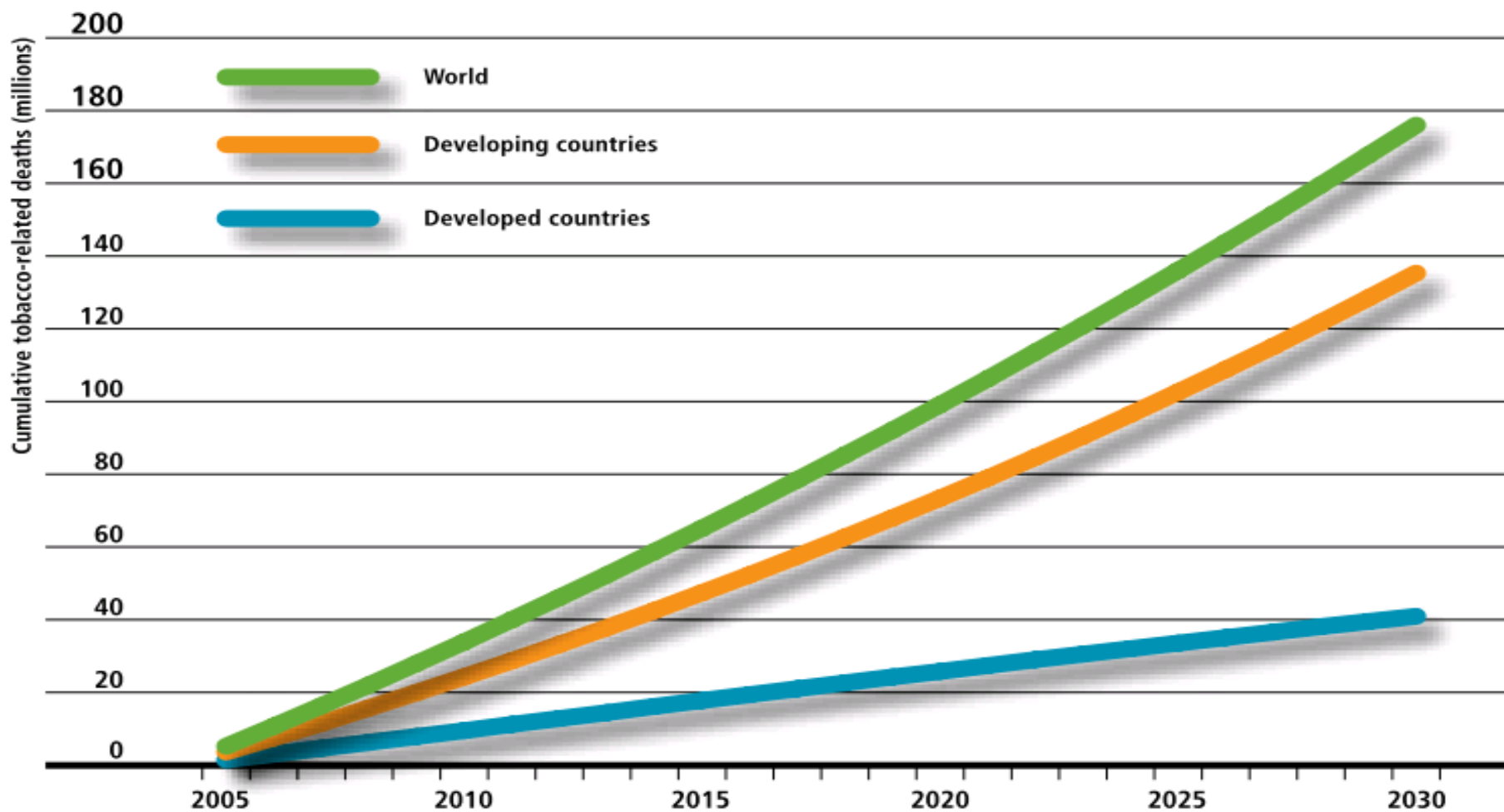


- Most of the tobacco control initiatives: aimed towards cessation of smoking.
- Main strategy to decrease smoking prevalence: high amount of taxes levied on smoking products.
- This strategy may facilitate an unintentional push towards SLT use as its cheaper compared to smoking.
- Additionally, big tobacco companies revert to manufacturing SLT products and advertising them as less harmful than smoking.
- A surge in the use of SLT products and subsequent increased risks for oral cancer for the general public.
- Awareness of the potential dangers related to such approach and new programs for SLT cessation.

TOBACCO WILL KILL OVER 175 MILLION PEOPLE WORLDWIDE BETWEEN NOW AND THE YEAR 2030



Cumulative tobacco-related deaths, 2005–2030



Source: Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Medicine*, 2006, 3(11):e442.



SAY NO TO TOBACCO!





THANKS

