

Chapter 3

TOBACCO RELATED CANCERS

There are cancers of several anatomical sites associated with the use of tobacco (TRCs) and NCRP has been using a conservative definition based on the International Agency for Research on Cancer (IARC) monographs on overall evaluations of carcinogenicity (IARC, 1987). The list of anatomical sites of cancer (along with corresponding ICD-10 codes) considered to be associated with the use of tobacco is given in Table 3.1.

Table 3.1: Sites of Cancer Included in TRCs along with Corresponding ICD Codes

Site	ICD-10 Code
Lip	C00
Tongue	C01-C02
Mouth	C03-C06
Pharynx	C10 and C12-C14
Oesophagus	C15
Larynx	C32
Lung	C33-34
Urinary Bladder	C67

Table 3.2: Number (#) and Proportion (%) of Cancers associated with Use of Tobacco Relative to All Sites of Cancer

Registry	Males			Females		
	All Sites	#	%	All Sites	#	%
TMH	14519	6251	43.1	11022	1556	14.1
KMIO	3897	1766	45.3	4790	988	20.6
CI (WIA)	4085	1762	43.1	4469	663	14.8
RCC - TVM	11447	4906	42.9	11759	1464	12.5
AMC	1794	955	53.2	1793	391	21.8
BBCI	13124	7353	56.0	9438	2403	25.5
PGIMER	9650	4146	43.0	7532	1089	14.5
BRAIRCH	4430	1647	37.2	3609	398	11.0
All Registries	62946	28786	45.7	54412	8952	16.5

Table 3.2 and Figure 3.1 provide the number and relative proportion of sites of cancer associated with use of tobacco as a whole relative to all sites of cancer, in different registries. The highest percentage of

TRC was observed in BCCI - Guwahati: both in males (56.0%) and in females (25.5%). In other registries, it varied from 37.2% to 53.2% of all cancers in males and from 11.0% to 21.8% in females.

Table 3.3 indicates the number and proportion of specific sites of TRC relative to all cancers. Table 3.4 and Figure 3.2 give the proportion relative to all TRC sites.

Males (Relative proportion (%) of TRC is given in parentheses)

TMH - Mumbai: Mouth (32.6%), lung (18.4%) and tongue (17.3%) were the main sites that contributed to overall TRCs.

KMIO - Bangalore: Oesophagus (16.9%), lung (16.7%) and Hypopharynx (16.4%) were the three leading sites among TRCs.

CI (WIA) - Chennai: Lung (23.1%) was the leading site among TRCs followed by mouth (22.6%) and tongue (17.9%).

RCC - TVM: Cancer of the lung accounted for 35.7% of TRCs followed by mouth (17.6%) and tongue (14.3%).

AMC - Dibrugarh: Cancer of the hypopharynx constituted 28.0% of TRCs followed by oesophagus (25.5%) and mouth (15.8%).

BCCI - Guwahati: Oesophagus (26.8%), hypopharynx (22.7%) and lung (14.1%) were the three leading sites among TRCs.

PGIMER - Chandigarh: Lung (27.6%) was the leading contributor to TRCs followed by oesophagus (15.7%), larynx and tongue (15.5%).

BRAIRCH - New Delhi: Mouth (23.9%) was the leading contributor to TRCs followed by lung (22.9%) and tongue (18.3%).

Females

TMH - Mumbai: Mouth (31.4%), lung (21.9%) and oesophagus (18.3%) were the leading sites among TRCs.

KMIO - Bangalore: Mouth (47.9%) contributed almost half of the TRCs. Another important site was oesophagus (22.8%).

CI (WIA) - Chennai: Mouth (28.1%) accounted for most of TRCs followed by oesophagus (20.1%) and lung (18.9%).

RCC - TVM: Mouth (31.1%) accounted for most of TRCs followed by lung (28.1%) and tongue (18.3%).

AMC - Dibrugarh: Oesophagus (40.7%) was the leading site in TRCs followed by mouth (16.4%) and hypopharynx (15.1%).

BCCI - Guwahati: Oesophagus (41.2%), mouth (20.0%) and lung (13.3%) were the three leading sites among TRCs.

PGIMER - Chandigarh: Oesophagus (43.9%) was the leading contributor to TRCs followed by lung (23.7%).

BRAIRCH - New Delhi: Lung (28.1%), oesophagus (21.6%) and mouth (21.1%) were the three leading sites among TRCs.

Fig. 3.1(a): Proportion (%) of Tobacco Related Cancers Relative to All Sites

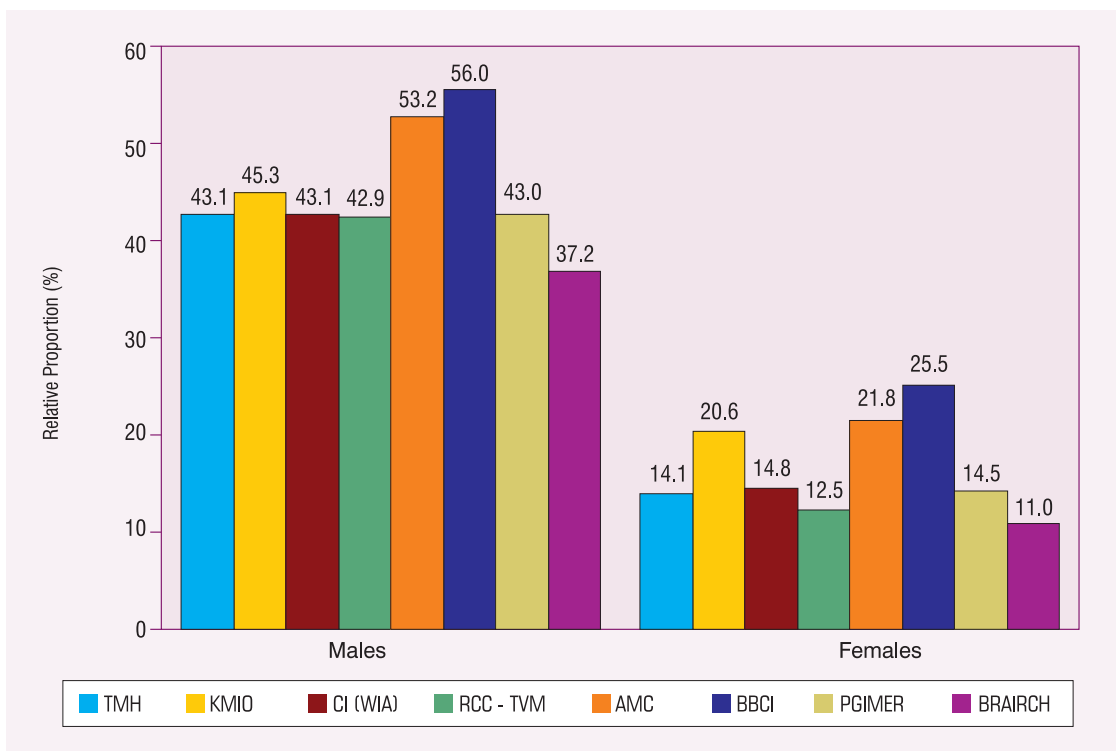


Fig. 3.1(b): Proportion (%) of Tobacco Related Cancers Relative to All Sites

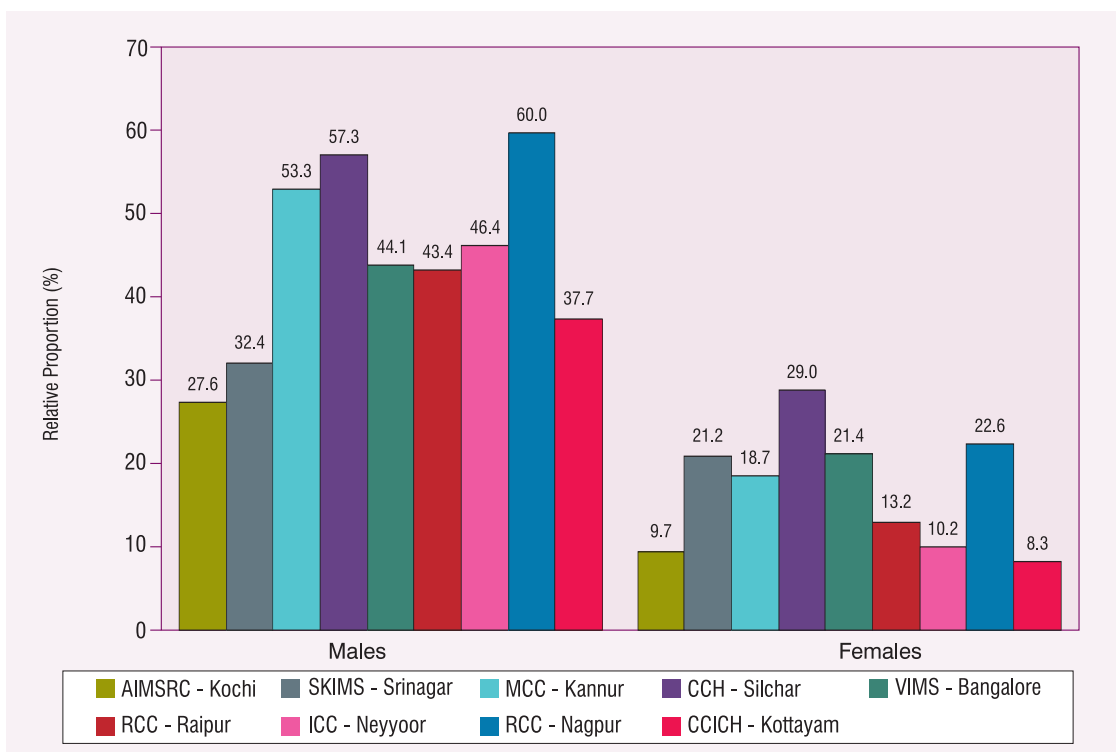


Fig. 3.2: Stack (100%) Diagram Showing Proportion of Specific Tobacco Related Sites Relative to All Tobacco Related Cancers

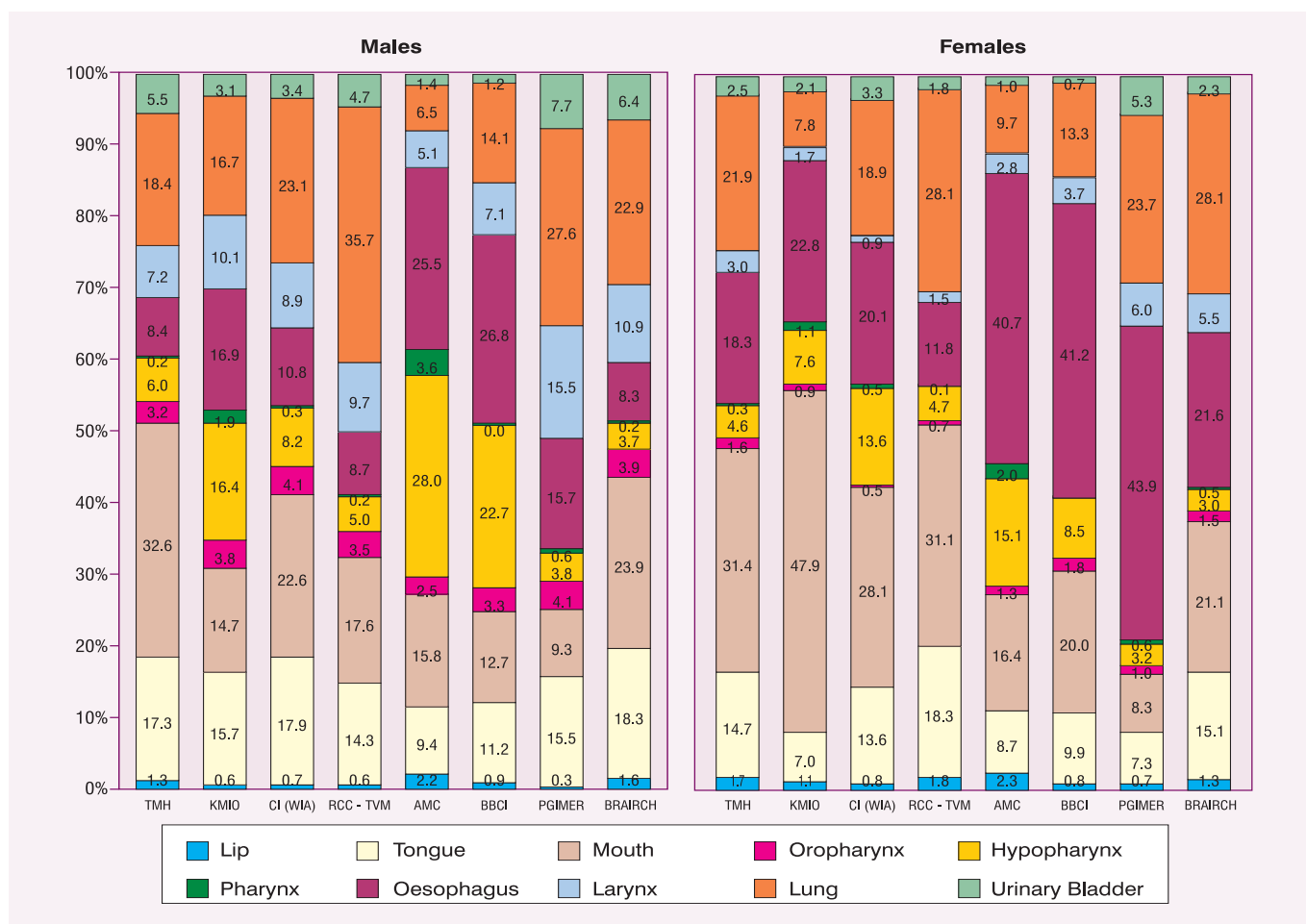


Table 3.5 and Figure 3.3 give the number and proportion of the TRCs by five year age groups. Among males the higher proportion of TRCs was seen in 60-64 year age group in KMIO - Bangalore, CI (WIA) - Chennai, RCC - TVM, AMC - Dibrugarh, PGIMER - Chandigarh and BRAIRCH - New Delhi whereas in TMH - Mumbai and BBCI - Guwahati it was seen in the 55-59 year age group. In females, the higher proportion of TRCs was seen in age groups above 60 years except in TMH - Mumbai and CI (WIA) - Chennai where the age group 45-49 and 50-54 years had higher values respectively.

The mean age (\pm SD) of TRCs was the lowest in TMH - Mumbai (54.5 ± 12.4) in males whereas in females it was seen in BRAIRCH - New Delhi (55.1 ± 12.9). Among both males and females the highest mean ages of TRCs were seen in RCC - TVM (60.9 ± 10.7 , 60.6 ± 12.3).

Table 3.3: Number (#) and Relative Proportion (%) of Specific Sites of Cancer Associated with Use of Tobacco Relative to All Sites of Cancer**Males**

Sites of Cancer	TMH		KMIO		CI (WIA)		RCC - TVM		AMC		BBCI		PGIMER		BRAIRCH	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Lip	81	0.6	11	0.3	12	0.3	28	0.2	21	1.2	64	0.5	13	0.1	26	0.6
Tongue	1080	7.4	278	7.1	316	7.7	703	6.1	90	5.0	823	6.3	642	6.7	301	6.8
Mouth	2036	14.0	260	6.7	398	9.7	862	7.5	151	8.4	931	7.1	385	4.0	394	8.9
Oropharynx	199	1.4	67	1.7	73	1.8	170	1.5	24	1.3	243	1.9	171	1.8	64	1.4
Hypopharynx	374	2.6	290	7.4	144	3.5	247	2.2	267	14.9	1666	12.7	157	1.6	61	1.4
Pharynx	12	0.1	34	0.9	5	0.1	8	0.1	34	1.9	1	0.0	24	0.2	3	0.1
Oesophagus	528	3.6	298	7.6	191	4.7	428	3.7	244	13.6	1973	15.0	649	6.7	137	3.1
Larynx	447	3.1	178	4.6	156	3.8	478	4.2	49	2.7	522	4.0	643	6.7	179	4.0
Lung	1151	7.9	295	7.6	407	10.0	1751	15.3	62	3.5	1040	7.9	1144	11.9	377	8.5
Urinary Bladder	343	2.4	55	1.4	60	1.5	231	2.0	13	0.7	90	0.7	318	3.3	105	2.4
TRC	6251	43.1	1766	45.3	1762	43.1	4906	42.9	955	53.2	7353	56.0	4146	43.0	1647	37.2
All Sites	14519	100.0	3897	100.0	4085	100.0	11447	100.0	1794	100.0	13124	100.0	9650	100.0	4430	100.0

Females

Sites of Cancer	TMH		KMIO		CI (WIA)		RCC - TVM		AMC		BBCI		PGIMER		BRAIRCH	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Lip	26	0.2	11	0.2	5	0.1	27	0.2	9	0.5	20	0.2	8	0.1	5	0.1
Tongue	229	2.1	69	1.4	90	2.0	268	2.3	34	1.9	237	2.5	79	1.0	60	1.7
Mouth	489	4.4	473	9.9	186	4.2	455	3.9	64	3.6	481	5.1	90	1.2	84	2.3
Oropharynx	25	0.2	9	0.2	3	0.1	10	0.1	5	0.3	44	0.5	11	0.1	6	0.2
Hypopharynx	71	0.6	75	1.6	90	2.0	69	0.6	59	3.3	205	2.2	35	0.5	12	0.3
Pharynx	5	0.05	11	0.2	3	0.1	2	0.02	8	0.4	1	0.0	7	0.1	2	0.1
Oesophagus	285	2.6	225	4.7	133	3.0	173	1.5	159	8.9	989	10.5	478	6.3	86	2.4
Larynx	47	0.4	17	0.4	6	0.1	22	0.2	11	0.6	89	0.9	65	0.9	22	0.6
Lung	340	3.1	77	1.6	125	2.8	412	3.5	38	2.1	319	3.4	258	3.4	112	3.1
Urinary Bladder	39	0.4	21	0.4	22	0.5	26	0.2	4	0.2	18	0.2	58	0.8	9	0.2
TRC	1556	14.1	988	20.6	663	14.8	1464	12.5	391	21.8	2403	25.5	1089	14.5	398	11.0
All Sites	11022	100.0	4790	100.0	4469	100.0	11759	100.0	1793	100.0	9438	100.0	7532	100.0	3609	100.0

Table 3.4: Number (#) and Relative Proportion (%) of Specific Sites of Cancer among Tobacco Related Cancers (TRC)**Males**

Sites of Cancer	TMH		KMIO		CI (WIA)		RCC - TVM		AMC		BBCI		PGIMER		BRAIRCH	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Lip	81	1.3	11	0.6	12	0.7	28	0.6	21	2.2	64	0.9	13	0.3	26	1.6
Tongue	1080	17.3	278	15.7	316	17.9	703	14.3	90	9.4	823	11.2	642	15.5	301	18.3
Mouth	2036	32.6	260	14.7	398	22.6	862	17.6	151	15.8	931	12.7	385	9.3	394	23.9
Oropharynx	199	3.2	67	3.8	73	4.1	170	3.5	24	2.5	243	3.3	171	4.1	64	3.9
Hypopharynx	374	6.0	290	16.4	144	8.2	247	5.0	267	28.0	1666	22.7	157	3.8	61	3.7
Pharynx	12	0.2	34	1.9	5	0.3	8	0.2	34	3.6	1	0.0	24	0.6	3	0.2
Oesophagus	528	8.4	298	16.9	191	10.8	428	8.7	244	25.5	1973	26.8	649	15.7	137	8.3
Larynx	447	7.2	178	10.1	156	8.9	478	9.7	49	5.1	522	7.1	643	15.5	179	10.9
Lung	1151	18.4	295	16.7	407	23.1	1751	35.7	62	6.5	1040	14.1	1144	27.6	377	22.9
Urinary Bladder	343	5.5	55	3.1	60	3.4	231	4.7	13	1.4	90	1.2	318	7.7	105	6.4
TRC	6251	100.0	1766	100.0	1762	100.0	4906	100.0	955	100.0	7353	100.0	4146	100.0	1647	100.0

Females

Sites of Cancer	TMH		KMIO		CI (WIA)		RCC - TVM		AMC		BBCI		PGIMER		BRAIRCH	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Lip	26	1.7	11	1.1	5	0.8	27	1.8	9	2.3	20	0.8	8	0.7	5	1.3
Tongue	229	14.7	69	7.0	90	13.6	268	18.3	34	8.7	237	9.9	79	7.3	60	15.1
Mouth	489	31.4	473	47.9	186	28.1	455	31.1	64	16.4	481	20.0	90	8.3	84	21.1
Oropharynx	25	1.6	9	0.9	3	0.5	10	0.7	5	1.3	44	1.8	11	1.0	6	1.5
Hypopharynx	71	4.6	75	7.6	90	13.6	69	4.7	59	15.1	205	8.5	35	3.2	12	3.0
Pharynx	5	0.3	11	1.1	3	0.5	2	0.1	8	2.0	1	0.0	7	0.6	2	0.5
Oesophagus	285	18.3	225	22.8	133	20.1	173	11.8	159	40.7	989	41.2	478	43.9	86	21.6
Larynx	47	3.0	17	1.7	6	0.9	22	1.5	11	2.8	89	3.7	65	6.0	22	5.5
Lung	340	21.9	77	7.8	125	18.9	412	28.1	38	9.7	319	13.3	258	23.7	112	28.1
Urinary Bladder	39	2.5	21	2.1	22	3.3	26	1.8	4	1.0	18	0.7	58	5.3	9	2.3
TRC	1556	100.0	988	100.0	663	100.0	1464	100.0	391	100.0	2403	100.0	1089	100.0	398	100.0

“If we knew what we were doing it would not be called research, would it?”

- Albert Einstein

Table 3.5: Number (#) and Relative Proportion (%) of Tobacco Related Cancers by Five-Year Age Groups with Standard Deviation (SD)**Males**

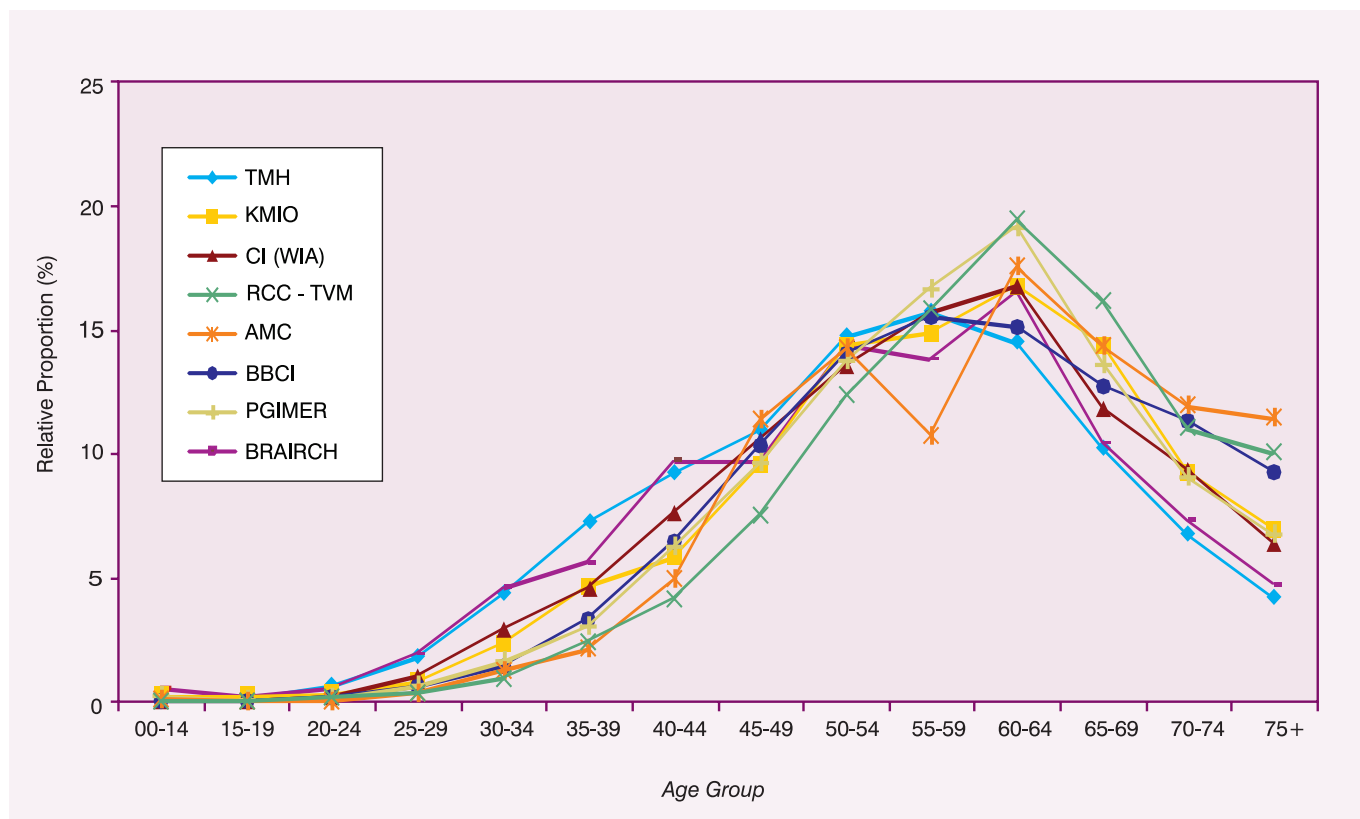
Age Group	TMH		KMIO		CI (WIA)		RCC - TVM		AMC		BBCI		PGIMER		BRAIRCH	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
00-14	3	0.0	4	0.2	-	-	-	-	1	0.1	1	0.0	8	0.2	8	0.5
15-19	8	0.1	3	0.2	-	-	1	0.0	-	-	2	0.0	2	0.0	4	0.2
20-24	36	0.6	6	0.3	3	0.2	8	0.2	-	-	14	0.2	5	0.1	8	0.5
25-29	114	1.8	15	0.8	18	1.0	13	0.3	3	0.3	45	0.6	24	0.6	32	1.9
30-34	266	4.3	41	2.3	51	2.9	44	0.9	11	1.2	101	1.4	68	1.6	76	4.6
35-39	450	7.2	82	4.6	80	4.5	118	2.4	20	2.1	239	3.3	126	3.0	92	5.6
40-44	576	9.2	102	5.8	134	7.6	199	4.1	47	4.9	471	6.4	255	6.2	160	9.7
45-49	683	10.9	168	9.5	185	10.5	368	7.5	108	11.3	757	10.3	398	9.6	160	9.7
50-54	918	14.7	252	14.3	238	13.5	604	12.3	136	14.2	1031	14.0	566	13.7	237	14.4
55-59	979	15.7	261	14.8	275	15.6	775	15.8	102	10.7	1140	15.5	687	16.6	228	13.8
60-64	904	14.5	295	16.7	295	16.7	954	19.4	167	17.5	1112	15.1	793	19.1	271	16.5
65-69	637	10.2	253	14.3	208	11.8	788	16.1	137	14.3	931	12.7	562	13.6	172	10.4
70-74	416	6.7	163	9.2	164	9.3	541	11.0	114	11.9	833	11.3	374	9.0	121	7.3
75+	261	4.2	121	6.9	111	6.3	493	10.0	109	11.4	676	9.2	278	6.7	78	4.7
All Ages	6251	100.0	1766	100.0	1762	100.0	4906	100.0	955	100.0	7353	100.0	4146	100.0	1647	100.0
Mean		54.5		57.9		57.3		60.9		60.7		59.1		58.6		54.9
SD		12.4		12.1		11.9		10.7		11.8		11.6		11.2		13.0

Females

Age Group	TMH		KMIO		CI (WIA)		RCC - TVM		AMC		BBCI		PGIMER		BRAIRCH	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
00-14	4	0.3	-	-	-	-	3	0.2	-	-	1	0.0	2	0.2	1	0.3
15-19	4	0.3	3	0.3	-	-	2	0.1	1	0.3	2	0.1	3	0.3	-	-
20-24	9	0.6	4	0.4	5	0.8	4	0.3	2	0.5	7	0.3	6	0.6	4	1.0
25-29	18	1.2	13	1.3	9	1.4	11	0.8	1	0.3	22	0.9	18	1.7	10	2.5
30-34	48	3.1	26	2.6	20	3.0	15	1.0	6	1.5	44	1.8	28	2.6	12	3.0
35-39	81	5.2	44	4.5	29	4.4	38	2.6	22	5.6	120	5.0	46	4.2	32	8.0
40-44	134	8.6	74	7.5	54	8.1	96	6.6	35	9.0	170	7.1	79	7.3	26	6.5
45-49	239	15.4	123	12.4	79	11.9	137	9.4	67	17.1	282	11.7	121	11.1	44	11.1
50-54	212	13.6	146	14.8	112	16.9	159	10.9	58	14.8	358	14.9	149	13.7	53	13.3
55-59	209	13.4	137	13.9	104	15.7	173	11.8	61	15.6	333	13.9	151	13.9	57	14.3
60-64	238	15.3	152	15.4	99	14.9	229	15.6	69	17.6	394	16.4	189	17.4	73	18.3
65-69	166	10.7	107	10.8	79	11.9	233	15.9	35	9.0	265	11.0	134	12.3	40	10.1
70-74	118	7.6	98	9.9	49	7.4	156	10.7	22	5.6	240	10.0	94	8.6	26	6.5
75+	76	4.9	61	6.2	24	3.6	208	14.2	12	3.1	165	6.9	69	6.3	20	5.0
All Ages	1556	100.0	988	100.0	663	100.0	1464	100.0	391	100.0	2403	100.0	1089	100.0	398	100.0
Mean		55.3		55.8		55.7		60.6		55.4		57.4		56.9		55.1
SD		12.4		12.2		11.7		12.3		10.7		11.9		12.5		12.9

Fig. 3.3: Relative Proportion (%) of Tobacco Related Cancers by Five-Year Age Group

Males



Females

