

Chapter 3

TOBACCO RELATED CANCERS

There are 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.

In 2004, IARC (IARC 2004) in a newer monograph states, that, there is now sufficient evidence to establish a causal association between cigarette smoking and cancers of the nasal cavities and nasal sinuses, oesophagus (Adenocarcinoma), stomach, liver, kidney (Renal Cell Carcinoma), uterine cervix and myeloid leukaemia apart from the sites in the earlier monograph (IARC,1987).

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 (2007-2011)

Registry	Males			Females		
	All Sites	#	%	All Sites	#	%
Mumbai	22580	9801	43.4	18528	2758	14.9
Bangalore	11273	5075	45.0	13125	2723	20.7
Chennai	15731	6677	42.4	17499	2817	16.1
Thi'puram	19219	8595	44.7	18809	2546	13.5
Dibrugarh	2895	1622	56.0	2276	582	25.6
Guwahati	6803	4028	59.2	4679	1248	26.7
Chandigarh	2643	1026	38.8	2092	254	12.1
All Registries	81144	36824	45.4	77008	12928	16.8

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 Guwahati: both in males (59.2%) and in females (26.7%). In other registries, it varied from 38.8% to 56.0% of all cancers in males and from 12.1% to 25.6% 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)

Mumbai: Mouth (28.3%), lung (18.4%) and tongue (16.4%) were the main sites that contributed to overall TRCs.

Bangalore: Hypopharynx (18.6%), oesophagus (17.5%) and lung (15.6%) were the three leading sites among TRCs.

Chennai: Lung (21.0%) was the leading site among TRCs followed by mouth (20.2%) and tongue (15.9%).

Thiruvananthapuram: Cancer of the lung accounted for 33.1% of TRCs followed by mouth (18.5%) and tongue (14.1%).

Dibrugarh: Cancer of the hypopharynx constituted 27.2% of TRCs followed by oesophagus (23.4%) and mouth (15.8%).

Guwahati: Oesophagus (25.3%), hypopharynx (20.0%) and mouth (13.5%) were the three leading sites among TRCs.

Chandigarh: Lung (23.7%) was the leading contributor to TRCs followed by tongue (18.7%) and oesophagus (16.0%).

Females

Mumbai: Mouth (29.6%), lung (19.0%) and oesophagus (18.5%) were the leading sites among TRCs.

Bangalore: Mouth (49.7%) contributed half of the TRCs. Another important site was oesophagus (24.5%).

Chennai: Mouth (32.4%) accounted for most of TRCs followed by oesophagus (19.8%) and lung (14.5%).

Thiruvananthapuram: Like in Mumbai, Bangalore and Chennai, in Thiruvananthapuram also mouth (34.9%) accounted for most of TRCs followed by tongue (21.5%) and lung (20.5%).

Dibrugarh: Oesophagus (40.7%) was the leading site in TRCs followed by mouth (19.9%) and hypopharynx (12.9%).

Guwahati: Oesophagus (39.0%), mouth (20.1%) and lung (11.2%) were the three leading sites among TRCs.

Chandigarh: Oesophagus (41.7%) was the leading contributor to TRCs followed by lung (18.5%) and tongue (15.0%).

Fig. 3.1: Proportion (%) of Tobacco Related Cancers Relative to All Sites (2007-2011)

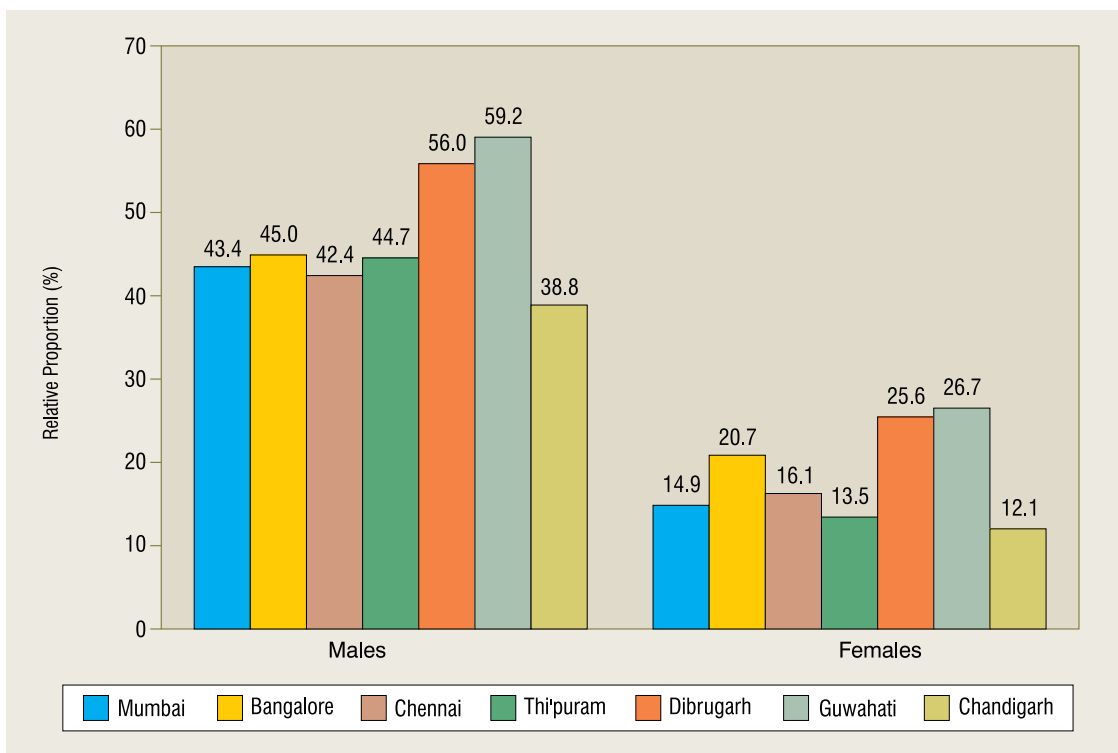


Fig. 3.2: Stack (100%) Diagram Showing Proportion of Specific Tobacco Related Sites Relative to All Tobacco Related Cancers (2007-2011)

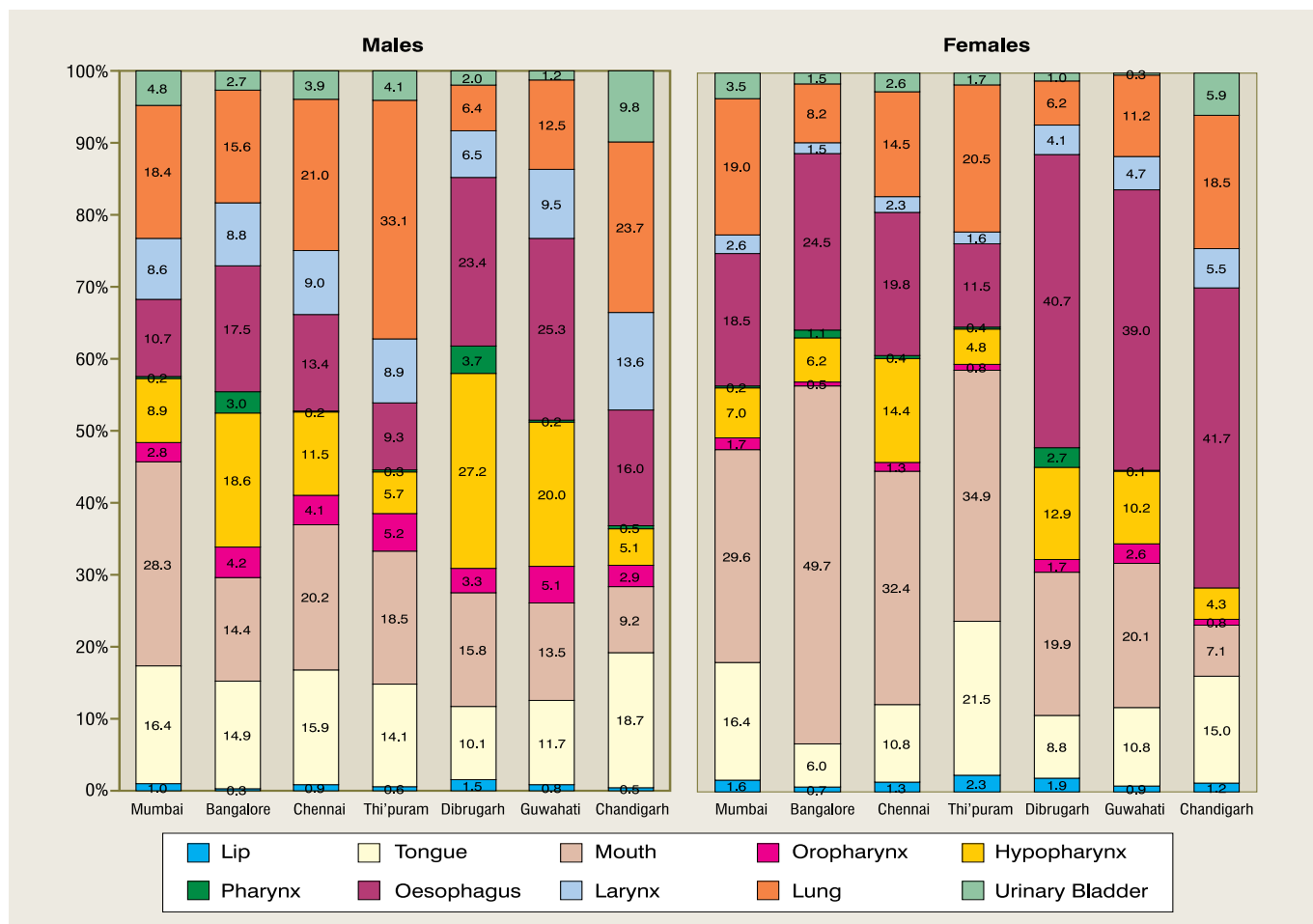


Table 3.3: Number (#) and Relative Proportion (%) of Specific Sites of Cancer Associated with Use of Tobacco Relative to All Sites of Cancer (2007-2011)**Males**

Sites of Cancer	Mumbai		Bangalore		Chennai		Thi'puram		Dibrugarh		Guwahati		Chandigarh	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Lip	98	0.4	17	0.2	60	0.4	54	0.3	25	0.9	34	0.5	5	0.2
Tongue	1603	7.1	754	6.7	1061	6.7	1214	6.3	164	5.7	472	6.9	192	7.3
Mouth	2776	12.3	731	6.5	1351	8.6	1593	8.3	257	8.9	545	8.0	94	3.6
Oropharynx	271	1.2	213	1.9	273	1.7	451	2.3	54	1.9	205	3.0	30	1.1
Hypopharynx	869	3.8	946	8.4	765	4.9	490	2.5	441	15.2	807	11.9	52	2.0
Pharynx	22	0.1	152	1.3	13	0.1	27	0.1	60	2.1	10	0.1	5	0.2
Oesophagus	1045	4.6	887	7.9	892	5.7	798	4.2	380	13.1	1020	15.0	164	6.2
Larynx	841	3.7	447	4.0	599	3.8	766	4.0	106	3.7	382	5.6	140	5.3
Lung	1808	8.0	790	7.0	1404	8.9	2847	14.8	103	3.6	503	7.4	243	9.2
Urinary Bladder	468	2.1	138	1.2	259	1.6	355	1.8	32	1.1	50	0.7	101	3.8
TRC	9801	43.4	5075	45.0	6677	42.4	8595	44.7	1622	56.0	4028	59.2	1026	38.8
All Sites	22580	100.0	11273	100.0	15731	100.0	19219	100.0	2895	100.0	6803	100.0	2643	100.0

Females

Sites of Cancer	Mumbai		Bangalore		Chennai		Thi'puram		Dibrugarh		Guwahati		Chandigarh	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Lip	45	0.2	20	0.2	37	0.2	58	0.3	11	0.5	11	0.2	3	0.1
Tongue	452	2.4	163	1.2	305	1.7	548	2.9	51	2.2	135	2.9	38	1.8
Mouth	815	4.4	1354	10.3	914	5.2	889	4.7	116	5.1	251	5.4	18	0.9
Oropharynx	47	0.3	14	0.1	37	0.2	20	0.1	10	0.4	33	0.7	2	0.1
Hypopharynx	192	1.0	169	1.3	406	2.3	123	0.7	75	3.3	127	2.7	11	0.5
Pharynx	5	0.0	31	0.2	12	0.1	9	0.0	16	0.7	1	0.0	-	-
Oesophagus	510	2.8	666	5.1	559	3.2	293	1.6	237	10.4	487	10.4	106	5.1
Larynx	71	0.4	41	0.3	64	0.4	42	0.2	24	1.1	59	1.3	14	0.7
Lung	524	2.8	224	1.7	409	2.3	521	2.8	36	1.6	140	3.0	47	2.2
Urinary Bladder	97	0.5	41	0.3	74	0.4	43	0.2	6	0.3	4	0.1	15	0.7
TRC	2758	14.9	2723	20.7	2817	16.1	2546	13.5	582	25.6	1248	26.7	254	12.1
All Sites	18528	100.0	13125	100.0	17499	100.0	18809	100.0	2276	100.0	4679	100.0	2092	100.0

Table 3.4: Number (#) and Relative Proportion (%) of Specific Sites of Cancer among Tobacco Related Cancers (TRC) (2007-2011)**Males**

Sites of Cancer	Mumbai		Bangalore		Chennai		Thi'puram		Dibrugarh		Guwahati		Chandigarh	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Lip	98	1.0	17	0.3	60	0.9	54	0.6	25	1.5	34	0.8	5	0.5
Tongue	1603	16.4	754	14.9	1061	15.9	1214	14.1	164	10.1	472	11.7	192	18.7
Mouth	2776	28.3	731	14.4	1351	20.2	1593	18.5	257	15.8	545	13.5	94	9.2
Oropharynx	271	2.8	213	4.2	273	4.1	451	5.2	54	3.3	205	5.1	30	2.9
Hypopharynx	869	8.9	946	18.6	765	11.5	490	5.7	441	27.2	807	20.0	52	5.1
Pharynx	22	0.2	152	3.0	13	0.2	27	0.3	60	3.7	10	0.2	5	0.5
Oesophagus	1045	10.7	887	17.5	892	13.4	798	9.3	380	23.4	1020	25.3	164	16.0
Larynx	841	8.6	447	8.8	599	9.0	766	8.9	106	6.5	382	9.5	140	13.6
Lung	1808	18.4	790	15.6	1404	21.0	2847	33.1	103	6.4	503	12.5	243	23.7
Urinary Bladder	468	4.8	138	2.7	259	3.9	355	4.1	32	2.0	50	1.2	101	9.8
TRC	9801	100.0	5075	100.0	6677	100.0	8595	100.0	1622	100.0	4028	100.0	1026	100.0

Females

Sites of Cancer	Mumbai		Bangalore		Chennai		Thi'puram		Dibrugarh		Guwahati		Chandigarh	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Lip	45	1.6	20	0.7	37	1.3	58	2.3	11	1.9	11	0.9	3	1.2
Tongue	452	16.4	163	6.0	305	10.8	548	21.5	51	8.8	135	10.8	38	15.0
Mouth	815	29.6	1354	49.7	914	32.4	889	34.9	116	19.9	251	20.1	18	7.1
Oropharynx	47	1.7	14	0.5	37	1.3	20	0.8	10	1.7	33	2.6	2	0.8
Hypopharynx	192	7.0	169	6.2	406	14.4	123	4.8	75	12.9	127	10.2	11	4.3
Pharynx	5	0.2	31	1.1	12	0.4	9	0.4	16	2.7	1	0.1	-	-
Oesophagus	510	18.5	666	24.5	559	19.8	293	11.5	237	40.7	487	39.0	106	41.7
Larynx	71	2.6	41	1.5	64	2.3	42	1.6	24	4.1	59	4.7	14	5.5
Lung	524	19.0	224	8.2	409	14.5	521	20.5	36	6.2	140	11.2	47	18.5
Urinary Bladder	97	3.5	41	1.5	74	2.6	43	1.7	6	1.0	4	0.3	15	5.9
TRC	2758	100.0	2723	100.0	2817	100.0	2546	100.0	582	100.0	1248	100.0	254	100.0

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 50-54 year age group in Mumbai, in 60-64 year age group in Bangalore, Chennai, Thiruvananthapuram, Guwahati and Chandigarh and in 55-59 year age group in Dibrugarh. In females, the higher proportion of TRCs was seen in age groups above 60 years except in Mumbai and Chennai where the age group 50-54 years had higher values. Dibrugarh showed highest value (15.3) in 45-49 and 60-64 year age groups.

Among both males and females, the mean age (+SD) of TRCs was lowest in Mumbai (54.7+12.2, 54.6+12.6) and highest in Thiruvananthapuram (59.9+10.8, 60.3+12.3).

Table 3.5: Number (#) and Relative Proportion (%) of Tobacco Related Cancers by Five-Year Age Groups with Standard Deviation (SD) (2007-2011)**Males**

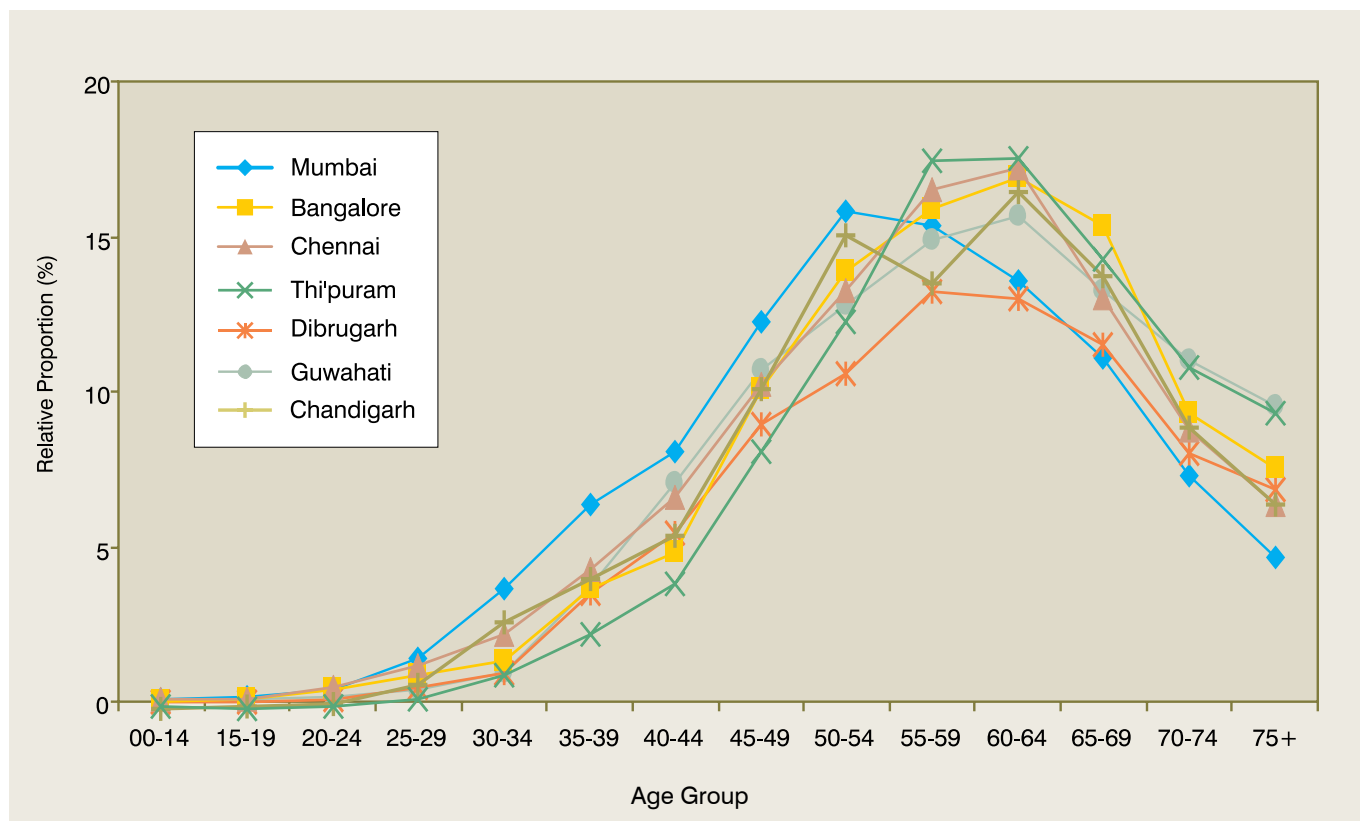
Age Group	Mumbai		Bangalore		Chennai		Thi'puram		Dibrugarh		Guwahati		Chandigarh	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
00-14	10	0.1	1	0.0	4	0.1	9	0.1	1	0.1				
15-19	12	0.1	4	0.1	6	0.1	2	0.0	2	0.1	2	0.0	1	0.1
20-24	39	0.4	20	0.4	29	0.4	7	0.1	3	0.2	6	0.1	2	0.2
25-29	136	1.4	44	0.9	76	1.1	25	0.3	10	0.6	17	0.4	8	0.8
30-34	355	3.6	65	1.3	146	2.2	92	1.1	20	1.2	37	0.9	29	2.8
35-39	623	6.4	186	3.7	284	4.3	205	2.4	69	4.3	149	3.7	43	4.2
40-44	789	8.1	242	4.8	439	6.6	352	4.1	107	6.6	283	7.0	58	5.7
45-49	1203	12.3	510	10.0	681	10.2	719	8.4	175	10.8	430	10.7	107	10.4
50-54	1553	15.8	704	13.9	885	13.3	1081	12.6	207	12.8	516	12.8	158	15.4
55-59	1502	15.3	808	15.9	1102	16.5	1528	17.8	258	15.9	598	14.8	142	13.8
60-64	1326	13.5	857	16.9	1148	17.2	1536	17.9	254	15.7	631	15.7	172	16.8
65-69	1089	11.1	778	15.3	867	13.0	1256	14.6	225	13.9	533	13.2	144	14.0
70-74	711	7.3	474	9.3	583	8.7	956	11.1	157	9.7	442	11.0	94	9.2
75+	453	4.6	382	7.5	427	6.4	827	9.6	134	8.3	384	9.5	68	6.6
All Ages	9801	100.0	5075	100.0	6677	100.0	8595	100.0	1622	100.0	4028	100.0	1026	100.0
Mean		54.7		58.4		57.1		59.9		58.1		58.7		57.4
SD		12.2		11.4		11.8		10.8		11.7		11.6		11.7

Females

Age Group	Mumbai		Bangalore		Chennai		Thi'puram		Dibrugarh		Guwahati		Chandigarh	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
00-14	10	0.4	2	0.1	1	0.0	4	0.2	-	-	1	0.1	1	0.4
15-19	2	0.1	7	0.3	4	0.1	3	0.1	2	0.3	1	0.1	-	-
20-24	22	0.8	14	0.5	22	0.8	9	0.4	1	0.2	7	0.6	4	1.6
25-29	47	1.7	26	1.0	48	1.7	25	1.0	6	1.0	6	0.5	4	1.6
30-34	103	3.7	45	1.7	74	2.6	33	1.3	8	1.4	23	1.8	7	2.8
35-39	136	4.9	107	3.9	179	6.4	82	3.2	33	5.7	55	4.4	14	5.5
40-44	243	8.8	190	7.0	239	8.5	124	4.9	57	9.8	77	6.2	28	11.0
45-49	350	12.7	347	12.7	328	11.6	199	7.8	89	15.3	176	14.1	22	8.7
50-54	431	15.6	407	14.9	414	14.7	267	10.5	81	13.9	185	14.8	32	12.6
55-59	380	13.8	374	13.7	405	14.4	371	14.6	76	13.1	179	14.3	34	13.4
60-64	392	14.2	461	16.9	398	14.1	393	15.4	89	15.3	203	16.3	32	12.6
65-69	318	11.5	346	12.7	340	12.1	381	15.0	66	11.3	159	12.7	38	15.0
70-74	190	6.9	212	7.8	218	7.7	307	12.1	35	6.0	105	8.4	20	7.9
75+	134	4.9	185	6.8	147	5.2	348	13.7	39	6.7	71	5.7	18	7.1
All Ages	2758	100.0	2723	100.0	2817	100.0	2546	100.0	582	100.0	1248	100.0	254	100.0
Mean		54.6		56.8		55.2		60.3		55.5		56.7		55.6
SD		12.6		11.9		12.4		12.3		11.9		11.6		13.5

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

Males



Females

