

**Table 2.35. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract: type of tobacco and/or cigarette**

Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95% CI)	Comments	
Gallus <i>et al.</i> (2003a) Italy and Switzerland 1992-1999	Oral cavity, pharynx, oesophageal	60	692	<b>Oral cavity and pharynx</b>	1.0	Estimates from unconditional multiple logistic regression models, including terms for age, sex, study centre, education and alcohol consumption	
				Never smokers			
				<i>Current smokers</i>			
				Pipe/cigar only			6.6 (2.0-21.3)
				Ex-smokers			
				Piper/cigar only			4.4 (1.0-18.9)
				<i>Time since smoking cessation (years)</i>			
				<10			3.6 (2.4-5.4)
				≥10			1.3 (0.9-2.0)
				<b>Oesophagus</b>			
				Never smokers			1.0
				<i>Current smokers</i>			
				Pipe/cigar only			12.6 (3.6-43.6)
Ex-smokers							
Piper/cigar only	1.9 (0.3-13.2)						
<i>Time since smoking cessation (years)</i>							
<10	4.1 (2.5-7.0)						
≥10	1.4 (0.9-2.3)						
Znaor <i>et al.</i> (2003) India 1993-1999	Oral, pharyngeal and oesophageal ICD-9 140,141,143-5,146, 148, 149, 150	424	1799	<b>Oral</b>	1.0	Adjusted for age, center, education level, alcohol consumption and chewing	
				Never smokers			
				<i>Type of tobacco</i>			
				Cigarette only			0.99 (0.79-1.23)
				Bidi only			2.15 (1.75-2.63)
				Cigarette and Bidi only			1.49 (1.18-1.88)
				Chutta only			2.28 (1.50-3.45)
				Cigar/cheroot only			4.72 (2.41-9.25)
				Other combinations			1.56 (0.75-3.25)
				<b>Pharynx</b>			
				Never smokers			1.0
				<i>Type of tobacco</i>			
				Cigarette only			1.79 (1.29-2.50)
				Bidi only			4.68 (3.50-6.27)
				Cigarette and Bidi only			3.57 (2.55-4.98)
Chutta only	3.22 (1.85-5.78)						
Cigar/cheroot only	4.28 (1.63-11.20)						
Other combinations	2.97 (1.19-7.42)						

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Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95% CI)	Comments
Znaor <i>et al.</i> (2003) (contd)	Oral, pharyngeal and oesophageal ICD-9 140,141,143-5,146, 148, 149, 150	107	1799	<b>Oesophagus</b> Never smokers	1.0	Adjusted for age, center, education level, alcohol consumption and chewing
		97	789	<i>Type of tobacco</i> Cigarette only	1.83 (1.34-2.50)	
		186	548	Bidi only	3.28 (2.45-4.39)	
		155	357	Cigarette and Bidi only	2.72 (1.95-3.79)	
		8	83	Chutta only	1.20 (0.55-2.61)	
		8	18	Cigar/cheroot only	3.17 (1.24-8.09)	
		4	27	Other combinations	1.39 (0.45-4.23)	
Lissowska <i>et al.</i> (2003) Poland 1997-2000	Oral cavity and pharynx ICD-9 Tongue 141.0 Oral cavity 143.0-145.8 Oropharynx 146.0-46.9 Unspecified parts of pharynx 149	22	43	Never smokers	1.0	Estimates from unconditional logistic regression equations, including terms for gender, age, residence and drinking habits
		34	44	<i>Cigarettes type</i> Filtered	1.64 (0.73-3.65)	
		47	25	Mixed	4.24 (1.65-10.91)	
		15	5	Plain	6.46 (1.74-24.74)	
Castellsagué <i>et al.</i> (2004) Spain 1996-1999	Oral cavity and oropharynx ICD-O C01-C10 Tongue, base of tongue, gum, floor of mouth, palate, salivary glands, tonsil, other parts of the mouth and oropharynx	41	67	<i>Type of tobacco</i> Blond only	2.31 (1.15-4.64)	OR adjusted for center, gender, age group, years of schooling and average daily consumption of pure ethanol
		61	59	Mixed	4.55 (2.12-9.77)	
		215	125	Black only	7.72 (3.83-15.55)	
				<b>Blond only</b> <i>Average number of cigarettes of smoker per day</i>		
		55	113	Never smokers	1.0	
		14	27	Ex-smokers	2.15 (0.86-5.37)	
		18	23	Current of 1-20	2.92 (1.18-7.23)	
		4	14	Current of 21-30	1.83 (0.47-7.18)	
		5	2	Current ≥31	9.45 (1.40-63.82)	
				<i>Years of tobacco smoking</i>		
		14	27	Ex-smokers	2.18 (0.87-5.51)	
		14	15	Current 1-30	2.66 (0.92-7.68)	
		10	22	Current 31-50	2.58 (0.88-7.54)	
3	3	Current ≥51	5.77 (0.90-37.07)			

**Table 2.35. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract: type of tobacco and/or cigarette**

Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95% CI)	Comments
Castellsagué <i>et al.</i> (2004) (contd)	Oral cavity and oropharynx ICD-O C01-C10 Tongue, base of tongue, gum, floor of mouth, palate, salivary glands, tonsil, other parts of the mouth and oropharynx	55	113	<b>Mixed (blond and black)</b>		
				<i>Average number of cigarettes of smoker per day</i>		
				Never smokers	1.0	
				Ex-smokers	4.70 (1.41-15.63)	
				Current of 1-20	5.72 (1.54-21.21)	
				Current of 21-30	6.94 (2.02-23.77)	
				Current ≥31	9.18 (2.57-32.78)	
				<i>Years of tobacco smoking</i>		
				Ex-smokers	4.70 (1.41-15.73)	
				Current 1-30	8.47 (2.13-33.70)	
				Current 31-50	5.76 (1.81-18.31)	
				Current ≥51	11.58 (2.34-57.29)	
				<b>Black only</b>		
				<i>Average number of cigarettes of smoker per day</i>		
				Never smokers	1.0	
Ex-smokers	4.52 (1.74-11.72)					
Current of 1-20	17.90 (6.35-50.43)					
Current of 21-30	28.19 (9.22-86.20)					
Current ≥31	16.53 (5.52-49.50)					
<i>Years of tobacco smoking</i>						
Ex-smokers	4.81 (1.85-12.51)					
Current 1-30	11.75 (3.48-39.66)					
Current 31-50	19.99 (7.26-55.08)					
Current ≥51	29.67 (9.41-93.55)					
Menvielle <i>et al.</i> (2004a) France 1989-1991	Hypopharynx and larynx	89 445 125	27 132 45	<i>Type of tobacco</i>		
				Hand-rolled cigarette ≥ commercial	1.2 (0.97-1.4)	OR adjusted for age, alcohol consumption, duration of smoking and amount of tobacco smoked
				Black tobacco ≥ blond	1.2 (0.96-1.5)	
				Use of filter ≥ no filter	1.0 (0.9-1.2)	

**Table 2.35. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract: type of tobacco and/or cigarette**

Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95% CI)	Comments
Randi <i>et al.</i> (2007) Italy and Switzerland 1984-1999	Upper digestive tract (oral, pharynx and oesophageal) analyzed together; oral cavity and pharynx analyzed together	75	1008	<b>All upper digestive tract</b>		
				<i>Exclusive pipe smoking</i>		
		18	24	Never	1.0	Estimates from multiple logistic regression models including terms for age, center, education, body mass index, and alcohol consumption
		12	14	Ever	8.67 (3.99-18.85)	
		6	10	<i>Grams of tobacco per day</i>		
		14	19	≤10	7.94 (3.05-20.71)	
				>10	9.12 (2.80-29.74)	
				Current only	8.14 (3.52-18.85)	
				<b>Oral cavity/pharynx</b>		
				<i>Exclusive pipe smoking</i>		
30	788	Never	1.0			
11	15	Ever	12.57 (4.50-35.06)			
Sapkota <i>et al.</i> (2007) India 2001-2004	ICD-O-2 Hypopharynx C12, C13 Larynx C32.0, C32.1, C32.2-C32.9	149	457	<b>Hypopharynx</b>		Adjusted for center, age, sex, SES, alcohol consumption, tobacco snuffling and tobacco chewing
				<i>Ever smoke</i>		
		364	261	No	1.0	
				Yes	5.66 (3.99-8.02)	
				<b>Smoking product</b>		
		149	427	Never	1.0	
		48	104	Cigarette	3.82 (2.32-6.29)	
		278	113	Bidi	6.80 (4.64-9.97)	
		23	33	Cigarette and Bidi	4.74 (2.42-9.29)	
		13	11	Other	4.21 (1.69-10.47)	
				<b>Frequency of cigarette smoking</b>		
		151	427	0	1.0	
		24	79	1-10 per day	2.47 (1.34-4.54)	
		15	19	>10-20 per day	5.24 (2.19-12.53)	
9	6	>20 per day	9.75 (2.95-32.22)			
		<b>Duration of cigarette smoking</b>				
151	457	0 years	1.0			
4	44	1-15 years	1.15 (0.36-3.64)			
21	35	>15-30 years	4.77 (2.41-9.48)			
23	25	>30 years	4.26 (2.05-8.87)			

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Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95% CI)	Comments			
Sapkota <i>et al.</i> (2007) (contd)	ICD-O-2 Hypopharynx C12, C13 Larynx C32.0, C32.1, C32.2-C32.9	151 55 73 150	457 62 25 26	<i>Frequency of bidi smoking</i>		1.0 2.83 (1.73-4.63) 9.45 (5.32-16.78) 17.13 (9.97-29.44)	Adjusted for center, age, sex, SES, alcohol consumption, tobacco snuffling and tobacco chewing		
				0					
				1-10 per day					
				>10-20 per day					
				151 26 70 182	457 16 43 54	<i>Duration of bidi smoking</i>		1.0 6.35 (3.02-13.33) 5.51 (3.31-9.16) 9.22 (5.78-14.73)	
		0 years							
		1-15 years							
		>15-30 years							
				37 141	457 261	<b>Glottis</b> <i>Ever smoke</i>		1.0 5.35 (3.40-8.42)	
		No							
		Yes							
						37 37 87 11 6			427 104 113 33 11
		Never							
		Cigarette							
		Bidi							
				21 2 1 1	427 79 19 6	<i>Frequency of cigarette smoking</i>		1.0 1.33 (0.27-6.65) 4.28 (0.45-40.72) 6.55 (0.46-92.57)	
		0							
		1-10 per day							
		>10-20 per day							
				37 9 9 19	457 44 35 25	<i>Duration of cigarette smoking</i>		1.0 3.35 (1.36-8.23) 3.25 (1.36-7.79) 5.71 (2.55-12.81)	
		0 years							
		1-15 years							
		>15-30 years							
		37 15 18 54	457 62 25 26	<i>Frequency of bidi smoking</i>		1.0 2.01 (0.96-4.20) 5.31 (2.42-11.63) 14.59 (7.47-28.50)			
0									
1-10 per day									
> 10-20 per day									
				>20 per day					

**Table 2.35. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract: type of tobacco and/or cigarette**

Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95% CI)	Comments		
Sapkota <i>et al.</i> (2007) (contd)	ICD-O-2 Hypopharynx C12, C13 Larynx C32.0, C32.1, C32.2-C32.9	37 6 19 62	457 16 43 54	<i>Duration of bidi smoking</i>		Adjusted for center, age, sex, SES, alcohol consumption, tobacco snuffling and tobacco chewing		
				0 years	1.0			
				1-15 years	3.37 (1.15-9.90)			
				>15-30 years	3.96 (1.91-8.19)			
		>30 years	7.76 (4.16-14.47)					
							<b>Larynx_ other</b>	
							<i>Ever smoke</i>	
			39	457	No		1.0	
			174	261	Yes		8.28 (5.02-13.67)	
							<i>Smoking product</i>	
			39	427	Never		1.0	
			20	104	Cigarette		5.06 (2.50-10.26)	
			129	113	Bidi		9.61 (5.65-16.35)	
			17	33	Cigarette and bidi		9.52 (4.15-21.85)	
			7	11	Other		5.85 (1.85-18.50)	
							<i>Frequency of cigarette smoking</i>	
			40	427	0		1.0	
			8	79	1-10 per day		2.57 (1.02-6.32)	
			10	19	>10-20 per day		10.95 (3.94-30.40)	
			2	6	>20 per day		7.05 (1.12-44.46)	
							<i>Duration of cigarette smoking</i>	
			40	457	0 years		1.0	
			2	44	1-15 years		1.50 (0.32-7.06)	
	7	35	>15-30 years	4.51 (1.61-12.61)				
	11	25	>30 years	6.64 (2.65-16.64)				
				<i>Frequency of bidi smoking</i>				
	40	45762	01-10 per day	1.02.82 (1.40-5.67)				
	38	25	>10-20 per day	11.94 (5.74-24.84)				
	71	26	>20 per day	24.71 (12.56-48.61)				
				<i>Duration of bidi smoking</i>				
	40	457	0 years	1.0				
	2	16	1-15 years	1.54 (0.32-7.53)				
	32	43	>15-30 years	7.16 (3.60-14.23)				
	95	54	>30 years	12.99 (7.14-23.61)				

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Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95% CI)	Comments
Sapkota <i>et al.</i> (2007) (contd)	ICD-O-2 Hypopharynx C12, C13 Larynx C32.0, C32.1, C32.2-C32.9	21	457	<b>Supraglottis</b>		Adjusted for center, age, sex, SES, alcohol consumption, tobacco snuffling and tobacco chewing
				<i>Ever smoke</i>		
		99	261	No	1.0	
				Yes	6.69 (3.50-12.77)	
				<i>Smoking product</i>		
		21	427	Never	1.0	
		4	104	Cigarette	2.14 (0.63-7.30)	
		83	113	Bidi	7.53 (3.84-14.74)	
		9	33	Cigarette and bidi	15.92 (5.46-46.45)	
		3	11	Other	4.24 (0.81-22.20)	
				<i>Frequency of cigarette smoking</i>		
		21	427	0	1.0	
		2	79	1-10 per day	1.33 (0.27-6.65)	
		1	19	>10-20 per day	4.28 (0.45-40.72)	
		1	6	>20 per day	6.55 (0.46-92.57)	
				<i>Duration of cigarette smoking</i>		
		21	457	0 years	1.0	
		0	44	1-15 years	-	
		2	35	>15-30 years	3.77 (0.73-19.54)	
		2	25	>30 years	2.16 (0.39-11.85)	
				<i>Frequency of bidi smoking</i>		
21	457	0	1.0			
14	62	1-10 per day	3.07 (1.29-7.33)			
16	25	>10-20 per day	7.25 (2.77-18.94)			
53	26	>20 per day	20.31 (9.10-45.31)			
		<i>Duration of bidi smoking</i>				
21	457	0 years	1.0			
5	16	1-15 years	5.09 (1.43-18.16)			
19	43	>15-30 years	6.04 (2.54-14.35)			
59	54	30 years	11.04 (5.10-23.91)			

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Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95% CI)	Comments
De Stefani <i>et al.</i> (2007) Uruguay 1988-2000	Mouth and pharynx Excluded lip and nasopharynx			<b>Oral cancer</b>		
				<i>Type of tobacco</i>		
		8	374	Never smokers	1.0	Adjusted for age, residence, urban/rural status, hospital, year at diagnosis, education, family history of cancer among first-degree relatives, occupation, total vegetables and fruits consumption, mate intake and alcohol drinking
		125	570	Blond	6.1 (2.9-12.9)	
		50	191	Mixed	7.0 (3.2-15.4)	
		152	366	Black	13.3 (6.3-28.0)	
				<i>Type of cigarette</i>		
		8	374	Never smokers	1.0	
		104	461	Manufactured	6.7 (3.2-14.3)	
		44	158	Mixed	6.9 (3.1-15.4)	
		179	508	Hand-rolled	10.6 (5.0-22.3)	
				<i>Filter use</i>		
		8	374	Never smokers	1.0	
		23	128	Lifelong filter	5.3 (2.2-12.5)	
		86	357	Mixed	6.3 (2.9-13.4)	
		218	642	Plain	10.5 (5.0-21.8)	
				<b>Pharyngeal</b>		
				<i>Type of tobacco</i>		
		5	374	Never smokers	1.0	
		171	570	Blond	13.1 (5.2-32.6)	
55	191	Mixed	10.8 (4.1-27.9)			
210	366	Black	28.8 (11.5-72.2)			
		<i>Type of cigarette</i>				
5	374	Never smokers	1.0			
134	461	Manufactured	12.6 (5.0-31.6)			
45	158	Mixed	10.5 (4.0-27.6)			
257	508	Hand-rolled	25.0 (10.0-62.4)			
		<i>Filter use</i>				
5	374	Never smokers	1.0			
25	128	Lifelong filter	8.5 (3.1-23.6)			
104	357	Mixed	11.3 (4.5-28.6)			
307	642	Plain	23.3 (9.4-57.8)			



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Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95% CI)	Comments		
Applebaum <i>et al.</i> (2007) USA 1999-2003	Head and neck ICD-9 141, 143, 144, 145, 146, 148, 149 and 161	90	182	<b>Without HPV16 serology</b>		Models also controlled for sex, age, race, and education		
				<i>Smoking, pack-years</i>				
				92	152		None	1.0
							>0 to <20	1.2 (0.8-1.7)
		20 to <45	1.7 (1.2-2.6)					
		126	123	≥45	3.0 (2.0-4.6)			
				<b>With HPV16 serology</b>				
				<i>Smoking, pack-years</i>				
		90	182	None	1.0			
				>0 to <20	1.1 (0.7-1.7)			
				20 to <45	1.8 (1.2-2.7)			
		126	123	≥45	3.4 (2.2-5.3)			
				<b>Larynx</b>				
				<i>Smoking, pack-years</i>				
		5	182	None	1.0			
				>0 to <20	3.7 (1.3-10.6)			
				20 to <45	6.5 (2.3-18.5)			
		22	123	≥45	19.9 (7.2-54.9)			
				<b>Oral cavity</b>				
				<i>Smoking, pack-years</i>				
		44	182	None	1.0			
>0 to <20	0.9 (0.6-1.6)							
20 to <45	1.4 (0.8-2.4)							
52	123	≥45	1.8 (1.0-3.2)					
		<b>Pharynx</b>						
		<i>Smoking, pack-years</i>						
41	182	None	1.0					
		>0 to <20	0.9 (0.5-1.6)					
		20 to <45	1.6 (0.9-2.8)					
52	123	≥45	3.2 (1.8-5.6)					
		72	92	None	1.0			
				>0 to <20	0.9 (0.5-1.6)			
20 to <45	1.6 (0.9-2.8)							
72	92	≥45	3.2 (1.8-5.6)					

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Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95% CI)	Comments	
Applebaum <i>et al.</i> (2007) (contd)	Head and neck ICD-9 141, 143, 144, 145, 146, 148, 149 and 161			<b>Pharynx</b>		Joint effects OR, adjusted for sex, age, race, education, and alcohol consumption	
				<b>HPV16 serology</b>			
				<b>Negative</b>			
				<i>Cigarettes, pack-years</i>			
				None			1.0
				> 0 to <20			1.7 (0.7-4.0)
				20 to <45			3.4 (1.5-7.5)
				≥45			6.9 (3.1-15.1)
				<b>Positive</b>			
				<i>Cigarettes, pack-years</i>			
None	32.5 (13.3-79.5)						
>0 to <20	15.5 (6.3-37.9)						
20 to <45	22.4 (8.4-60.1)						
≥45	27.7 (9.8-77.9)						