

**Table 2.33. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract combined**

Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95%CI)	Comments
Olshan <i>et. al.</i> (2000) USA 1994-1997	Squamous cell carcinoma of head and neck analyzed together (including oral cavity, pharynx, or larynx)	11	74	Never	1.0	Adjusted for age, race, sex, and average number of drinks of alcohol per week
		171	128	Ever	4.1 (2.0-8.7)	
		11	74	<i>Average cigarettes per day</i>	1.0	
		46	44	0	3.3 (1.5-7.7)	
		112	69	1-19	4.6 (2.1-10.3)	
				20+		
				<i>Average cigarettes per day</i>		
		11	74	0	1.0	
		46	44	1-19	3.3 (1.4-7.7)	
		84	48	20-39	5.0 (2.2-11.2)	
		28	21	40+	3.7 (1.4-10.0)	
				<i>Total years of cigarette use</i>		
		11	74	0	1.0	
		19	38	1-19	2.3 (0.9-5.9)	
		75	52	20-39	4.2 (1.9-9.3)	
		64	23	40+	7.2 (2.8-18.6)	
				<i>Pack-years of tobacco use</i>		
		11	74	0	1.0	
		36	50	1-19	2.7 (1.2-6.2)	
		40	28	20-39	4.4 (1.8-10.7)	
83	37	40+	5.6 (2.4-13.0)			
		<b>GSTT1 (present)</b>				
8	66	Never	1.0			
136	103	Ever	4.9 (2.1-11.4)			
		<i>Average cigarettes per day</i>				
8	66	0	1.0			
37	38	1-19	3.9 (1.5-9.9)			
64	56	20+	5.1 (2.1-12.7)			
		<i>Pack-years of tobacco use</i>				
8	66	0	1.0			
28	41	1-19	3.3 (1.3-8.4)			
37	24	20-39	5.7 (2.1-15.3)			
60	30	40+	5.4 (2.0-14.2)			

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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
Olshan <i>et. al.</i> (2000) (contd)	Squamous cell carcinoma of head and neck analyzed together (including oral cavity, pharynx, or larynx)	3	7	<b>GSTT1 (null)</b>		
		29	19	Never	2.7 (0.5-12.9)	Adjusted for age, race, sex, and average number of drinks of alcohol per week
				Ever	5.1 (1.9-14.1)	
				<i>Average cigarettes per day</i>		
		3	7	0	2.7 (0.5-12.9)	
		7	4	1-19	3.7 (0.7-19.4)	
		21	11	20+	7.0 (2.2-22.0)	
				<i>Pack-years of tobacco use</i>		
		3	7	0	2.8 (0.6-13.3)	
		6	7	1-19	2.3 (0.5-10.6)	
		3	4	20-39	2.1 (0.3-16.5)	
		19	5	40+	13.4 (3.6-50.4)	
				<b>GSTM1 (present)</b>		
		6	48	Never	1.0	
		94	59	Ever	4.3 (1.6-11.6)	
				<i>Average cigarettes per day</i>		
		6	48	0	1.0	
		31	18	1-19	4.5 (1.4-14.4)	
		56	34	20+	4.4 (1.5-12.7)	
				<i>Pack-years of tobacco use</i>		
		6	48	0	1.0	
		21	17	1-19	4.0 (1.2-13.1)	
		25	17	20-39	4.1 (1.3-13.1)	
42	19	40+	5.1 (1.6-15.8)			
		<b>GSTM1 (null)</b>				
5	25	Never	1.3 (0.3-4.6)			
71	63	Ever	4.7 (1.8-12.3)			
		<i>Average cigarettes per day</i>				
5	25	0	1.2 (0.3-4.5)			
13	24	1-19	2.8 (0.9-8.8)			
52	33	20+	5.9 (2.1-17.0)			
		<i>Pack-years of tobacco use</i>				
5	25	0	1.2 (0.3-4.5)			
13	31	1-19	2.2 (0.7-6.7)			
15	11	20-39	6.5 (1.9-22.5)			
37	16	40+	7.4 (2.4-22.8)			

**Table 2.33. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract combined**

Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95%CI)	Comments
Olshan <i>et. al.</i> (2000) (contd)	Squamous cell carcinoma of head and neck analyzed together (including oral cavity, pharynx, or larynx)	3	34	<b>GSTP1 (Ile/Ile)</b>		
		59	41	Never	1.0	Adjusted for age, race, sex, and average number of drinks of alcohol per week
				Ever	7.4 (2.0-27.0)	
		3	34	<i>Average cigarettes per day</i>	1.0	
		18	13	0	6.3 (1.5-27.2)	
		37	23	1-19	8.4 (2.2-32.6)	
				20+		
				<i>Pack-years of tobacco use</i>		
		3	34	0	1.0	
		15	17	1-19	5.6 (1.4-23.4)	
		17	10	20-39	9.1 (2.0-40.3)	
		24	10	40+	9.0 (2.0-39.5)	
				<b>GSTP1 (Ile/Val or Val/Val)</b>		
		8	39	Never	2.3 (0.5-9.4)	
		106	81	Ever	6.6 (1.9-23.2)	
				<i>Average cigarettes per day</i>		
		8	39	0	2.3 (0.5-9.5)	
		26	29	1-19	5.1 (1.3-19.6)	
		71	44	20+	7.1 (1.9-26.4)	
				<i>Pack-years of tobacco use</i>		
		8	39	0	2.3 (0.6-9.6)	
		19	31	1-19	3.6 (0.9-14.4)	
		23	18	20-39	6.4 (1.6-26.0)	
55	25	40+	9.2 (2.4-35.2)			
		<b>NAT1 (4 or 11/4 or 11)</b>				
8	32	Never	1.0			
78	76	Ever	2.3 (0.9-5.6)			
		<i>Average cigarettes per day</i>				
8	32	0	1.0			
18	25	1-19	1.9 (0.7-5.4)			
54	42	20+	2.7 (1.0-7.1)			
		<i>Pack-years of tobacco use</i>				
8	32	0	1.0			
18	27	1-19	2.0 (0.7-5.7)			
18	19	20-39	2.3 (0.8-6.9)			
37	22	40+	2.8 (0.9-7.8)			

**Table 2.33. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract combined**

Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95%CI)	Comments
Olshan <i>et. al.</i> (2000) (contd)	Squamous cell carcinoma of head and neck analyzed together (including oral cavity, pharynx, or larynx)	3	41	<b>NAT1 (10/4 or 10/10)</b>		Adjusted for age, race, sex, and average number of drinks of alcohol per week
		86	46	Never	0.3 (0.1-1.4)	
		3	41	Ever	3.3 (1.3-8.4)	
		26	17	<i>Average cigarettes per day</i>		
		53	25	0	0.3 (0.1-1.4)	
				1-19	2.4 (0.8-7.4)	
				20+	3.5 (1.3-9.7)	
				<i>Pack-years of tobacco use</i>		
		3	41	0	0.3 (0.1-1.4)	
		16	21	1-19	1.4 (0.4-4.2)	
		22	9	20-39	3.8 (1.1-13.2)	
		41	13	40+	4.9 (1.6-14.9)	
				<b>CYP1A1 (Ile/Ile)</b>		
		10	68	Never	1.0	
		152	111	Ever	4.2 (1.9-9.0)	
				<i>Average cigarettes per day</i>		
		10	68	0	1.0	
		40	39	1-19	3.1 (1.3-7.4)	
		101	59	20+	5.0 (2.2-11.6)	
				<i>Pack-years of tobacco use</i>		
		10	68	0	1.0	
		31	43	1-19	2.6 (1.1-6.4)	
		37	26	20-39	4.4 (1.8-11.2)	
74	31	40+	5.7 (2.3-13.9)			
		<b>CYP1A1 (Ile/Val)</b>				
1	4	Never	2.8 (0.3-28.9)			
12	8	Ever	5.4 (1.6-17.9)			
		<i>Average cigarettes per day</i>				
1	4	0	2.6 (0.2-26.2)			
4	2	1-19	11.2 (1.7-76.0)			
6	6	20+	2.3 (0.5-10.7)			
		<i>Pack-years of tobacco use</i>				
1	4	0	2.4 (0.2-24.7)			
3	3	1-19	5.2 (0.8-31.9)			
2	2	20-39	2.8 (0.3-24.6)			
5	3	40+	4.9 (0.8-29.8)			

**Table 2.33. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract combined**

Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95%CI)	Comments
Garrote <i>et al.</i> (2001) Cuba 1996-1999	Oral cavity and oropharynx analyzed together	16	81	Never smokers	1.0	Estimates from unconditional logistic regression equations including terms for gender, age, area of residence, education and smoking and drinking habits
		42	39	Former smokers	6.31 (2.97-13.43)	
		25	25	<i>Current smokers</i>		
		36	26	<20 cigarettes/day	6.31 (2.75-14.46)	
		63	18	20-29 cigarettes/day	9.63 (4.28-21.64)	
		6	7	≥30 cigarettes/day	20.77 (8.93-48.30)	
		11	3	<4 cigars or equiv./day	4.31 (1.13-16.38)	
				≥4 cigars or equiv./day	20.45 (4.67-89.65)	
				<i>Age started smoking (yrs)</i>		
		45	29	≥17	1.0	
		42	23	14-16	3.24 (1.69-6.20)	
		54	27	<14	2.76 (1.55-4.89)	
				<i>Duration of smoking (yrs)</i>		
		26	29	<38	1.0	
		53	23	38-50	3.78 (2.05-6.99)	
62	27	≥51	3.39 (1.82-6.32)			
Chen <i>et al.</i> (2001) USA 1985-1995	Oral and oropharynx analyzed together	51	192	Never	1.0	Adjusted for age, race, and sex, alcohol consumption
		79	233	Former	1.1 (0.8-1.7)	
		211	127	Current	4.5 (3.0-6.8)	
		49	172	<20 pack-years	1.1 (0.7-1.7)	OR for pack-years cigarette smoking and acetylator status relative to baseline of persons who were never smokers and not slow acetylators.
		98	115	20-39 pack-years	2.9 (1.9-4.5)	
		85	48	40-59 pack-years	6.4 (3.8-10.7)	
		58	25	60+ pack-years	7.5 (4.0-14.2)	
		20	21	Smokeless tobacco use	1.3 (0.6-2.6)	
				<i>NAT2 (not slow)</i>		
		24	91	Never	1.0	
		18	77	1-19 pack-years	1.0 (0.5-1.8)	
		43	53	20-39 pack-years	2.2 (1.1-4.7)	
		58	29	40+ pack-years	6.6 (2.4-18.7)	
				<i>NAT2 (slow)</i>		
		27	101	Never	1.0 (0.5-1.9)	
31	95	1-19 pack-years	1.2 (0.7-2.2)			
55	62	20-39 pack-years	3.5 (1.7-7.1)			
85	44	40+ pack-years	3.5 (1.5-8.5)			

**Table 2.33. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract combined**

Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95%CI)	Comments
Chen <i>et al.</i> (2001) (contd)	Oral and oropharynx analyzed together			<b>NAT2 acetylator status</b>		OR for NAT2 acetylator status within strata of pack-years cigarette smoking are adjusted for age, race, sex and alcohol consumption
				<i>Not slow</i>		
		24	91	Never	1.0	
		18	77	1-19 pack-years	1.0	
		43	53	20-39 pack-years	1.0	
		58	29	40+ pack-years	1.0	
				<i>Slow</i>		
		27	101	Never	1.1 (0.6-2.1)	
		31	95	1-19 pack-years	1.3 (0.7-2.6)	
		55	62	20-39 pack-years	1.2 (0.7-2.1)	
85	44	40+ pack-years	0.9 (0.5-1.7)			
Gallus <i>et al.</i> (2003a) Italy and Switzerland 1992-1999	Oral cavity, pharynx analyzed together	60	692	Never smokers	1.0	Estimates from unconditional multiple logistic regression models, including terms for age, sex, study centre, education and alcohol consumption
		517	521	Current smokers	6.8 (4.9-9.4)	
				<i>Cigarettes per day</i>		
		108	205	<15	4.6 (3.1-6.7)	
		244	225	15-24	7.7 (5.3-11.0)	
		157	82	≥25	12.3 (7.9-19.0)	
				<i>Total duration of smoking (years)</i>		
		126	214	<30	5.1 (3.4-7.8)	
		391	307	≥30	7.7 (5.5-10.9)	
		172	557	Ex-smokers	2.1 (1.5-3.1)	
				<i>Cigarettes per day</i>		
		41	200	<15	1.7 (1.0-2.7)	
		125	347	≥15	2.3 (1.6-3.4)	
				<i>Total duration of smoking (years)</i>		
		67	344	<30	1.5 (1.0-2.3)	
105	213	≥30	3.1 (2.1-4.6)			
		<i>Tar yield</i>				
60	692	Never smokers	1.0			
		<i>Ever smokers (mg)</i>				
396	708	<20	4.2 (3.0-5.8)			
241	256	≥20	5.9 (4.1-8.5)			
		<i>Current smokers (mg)</i>				
318	382	<20	6.1 (4.4-8.6)			
163	90	≥20	9.8 (6.5-14.8)			

**Table 2.33. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract combined**

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) (contd)	Oral cavity, pharynx analyzed together	31	63	<i>Cigarettes smoked in the previous 6 months (mg)</i>		Estimates from unconditional multiple logistic regression models, including terms for age, sex, study centre, education and alcohol consumption
		462	434	<10	3.8 (2.2-6.8)	
Lissowska <i>et al.</i> (2003) Poland 1997-2000	Oral cavity and pharynx analyzed together	22	43	Never smokers	1.0	Estimates from unconditional logistic regression equations, including terms for gender, age, residence and drinking habits
		22	37	Former smokers	1.37 (0.58-3.25)	
		78	44	Current smokers	3.42 (1.46-8.03)	
				<i>No./day</i>		
		26	16	<15	4.07 (1.40-11.85)	
		21	13	15-20	4.72 (1.49-14.99)	
		31	15	>20	6.69 (2.15-20.77)	
				<i>Age started smoking (yrs)</i>		
		17	13	>20	1.0	
		39	19	18-20	1.96 (0.63-6.05)	
		22	12	≤17	2.56 (0.66-9.90)	
				<i>Years of smoking (yrs)</i>		
		12	16	≤26	1.0	
		21	15	27-35	1.96 (0.39-9.98)	
		45	13	>36	4.30 (0.72-25.82)	
		<i>Years since ceasing smoking</i>				
72	43	Current	1.0			
14	16	≤10	0.50 (0.20-1.25)			
12	33	>10	0.31 (0.12-0.83)			
		<i>Cigarettes type</i>				
		Never smoker	1.0			
34	44	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)			

**Table 2.33. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract combined**

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) Spain 1996-1999	Oral cavity and oropharynx analyzed together	55	113	Never smoker	1.0	OR adjusted for center, gender, age group, years of schooling and average daily consumption of pure ethanol	
		320	262	Ever smoker	4.10 (2.19-7.69)		
		82	133	Ex-smoker	2.36 (1.21-4.60)		
		238	129	Current smoker	6.41 (3.32-12.37)		
				<i>Smoking amount (average no. of cigs./day)</i>			
		28	50	1-10	2.60 (1.23-5.49)		
		97	80	11-20	4.94 (2.48-9.85)		
		87	61	21-30	5.23 (2.55-10.74)		
		64	40	31-40	4.54 (2.11-9.79)		
		44	30	≥41	4.35 (1.92-9.82)		
				<i>Smoking amount by smoking status</i>			
		40	72	Ex-smoker of 1 to 20 cigs./day	2.68 (1.31-5.50)		
		42	61	Ex-smoker of ≥21 cigs./day	2.10 (0.99-4.45)		
		15	21	Current smoker of 1 to 10 cigs./day	3.66 (1.42-9.43)		
		70	37	Current smoker of 11 to 20 cigs./day	8.48 (3.71-19.37)		
		76	40	Current smoker of 21 to 30 cigs./day	8.81 (3.82-20.35)		
		43	21	Current smoker of 31 to 40 cigs./day	7.30 (2.84-18.79)		
		34	9	Current smoker of ≥41 cigs./day	12.21 (4.08-36.54)		
				<i>Years of tobacco smoking</i>			
		10	14	1-10	2.23 (0.81-6.16)		
		14	21	11-20	2.84 (1.09-7.40)		
58	57	21-30	3.37 (1.55-7.32)				
73	75	31-40	3.79 (1.79-8.03)				
89	62	41-50	6.34 (2.95-13.60)				
76	33	≥51	10.19 (4.49-23.13)				
		<i>Smoking duration by smoking status</i>					
49	91	Ex-smoker of 1 to 40 years	2.43 (1.21-4.89)				
33	42	Ex-smoker of ≥41 years	2.81 (1.25-6.32)				
106	76	Current smoker of 1 to 40 years	4.40 (2.16-8.95)				
132	53	Current smoker of ≥41 years	9.56 (4.62-19.77)				

**Table 2.33. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract combined**

Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95%CI)	Comments
Rodriguez <i>et al.</i> (2004) Italy and Switzerland 1984-1997	Oral and pharynx analyzed together	14	125	Never smokers	1.0	Estimates from logistic regression models conditioned on sex, age and study centre, and adjusted for education, marital status, body mass index, tobacco, alcohol and coffee consumption
		17	66	Ex-smokers	2.30 (0.90-5.86)	
		20	39	<i>Current smokers (cigarettes/day)</i>		
		48	47	<15	4.37 (1.70-11.23)	
		37	22	15-24	11.26 (4.48-28.30)	
				≥25	20.66 (6.91-61.77)	
				<i>Duration of smoking (years)</i>		
		24	78	< 20	2.50 (1.06-5.89)	
		41	49	20-24	8.67 (3.43-21.92)	
		55	39	≥25	17.55 (6.54-46.77)	
Menvielle <i>et al.</i> (2004a) France 1989-1991	Hypopharynx and larynx analyzed together	386	75	Current smoker	1.0	OR adjusted for age, alcohol consumption, duration of smoking and amount of tobacco smoked
		103	93	Ex-smoker	0.3 (0.2-0.5)	
		386	75	<i>Duration since quitting</i>		
		68	36	Current smoker	1.0	
		29	36	10 years and less	0.4 (0.2-0.6)	
		6	21	11-20 years	0.2 (0.1-0.5)	
				21 years and more	0.1 (0.03-0.4)	
				<i>Age at starting</i>		
		248	65	17 years and less	1.0	
		187	71	18-20 years	1.0 (0.7-1.6)	
		54	32	21 years and more	1.5 (0.8-2.8)	
				<i>Type of tobacco</i>		
		89	27	Hand-rolled cigarette ≥ commercial	1.2 (0.97-1.4)	
		445	132	Black tobacco ≥ blond	1.2 (0.96-1.5)	
		125	45	Use of filter ≥ no filter	1.0 (0.9-1.2)	
15	74	<b>Current smoker</b>				
		Never smoker	1.0			
		<i>Duration 1-30 years Amount (g)</i>				
1	8	1-9	3.0 (1.1-8.0)			
11	3	10-19	4.0 (1.6-9.9)			
33	5	20-39	10.6 (4.4-25.5)			
14	2	>40	15.2 (5.7-40.8)			

**Table 2.33. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract combined**

Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95%CI)	Comments		
Menvielle <i>et al.</i> (2004a) (contd)	Hypopharynx and larynx analyzed together	5	2	<i>Duration 31-40 years Amount (g)</i>				
				1-9	8.7 (3.6-21.1)			
				10-19	11.5 (5.1-26.2)			
				20-39	30.6 (14.2-65.9)			
		13	5	94	7	>40	43.8 (17.9-107)	OR adjusted for age, alcohol consumption, duration of smoking and amount of tobacco smoked
						<i>Duration &gt;40 years Amount (g)</i>		
						1-9	8.0 (3.5-18.3)	
						10-19	10.6 (5.0-22.2)	
		32	5			20-39	28.1 (13.8-56.9)	
						>40	40.2 (17.5-92.3)	
		16	6			<b>Ex-smoker</b>		
						Never smoker		
		34	16			<i>Duration 1-30 years Amount (g)</i>		
						1-9	0.8 (0.3-2.1)	
		92	13			10-19	1.1 (0.5-2.5)	
						20-39	2.9 (1.3-6.4)	
		41	3			>40	4.2 (1.7-10.2)	
						<i>Duration 31-40 years Amount (g)</i>		
		15	74			1-9	2.4 (1.0-5.8)	
						10-19	3.2 (1.4-7.13)	
1	7			20-39	8.5 (4.1-17.6)			
				>40	12.1 (5.2-28.0)			
5	6			<i>Duration &gt;40 years Amount (g)</i>				
				1-9	2.2 (0.8-5.71)			
7	7			10-19	2.9 (1.2-6.9)			
				20-39	7.8 (3.4-17.6)			
23	13			>40	11.1 (4.2-29.3)			
				<i>Duration &gt;40 years Amount (g)</i>				
17	5			1-9	2.2 (0.8-5.71)			
				10-19	2.9 (1.2-6.9)			
2	3			20-39	7.8 (3.4-17.6)			
				>40	11.1 (4.2-29.3)			
Rosenquist <i>et al.</i> (2005) Sweden 2000-2004	Oral and pharynx analyzed together	41	154	<i>Cigarette consumption (cigarettes/day)</i>				
				Never smoked			1.0	
				1-10	1.1 (0.6-2.1)			
				11-20	2.4 (1.3-4.1)			
		21	74			>20	2.8 (1.3-6.1)	
						<i>Total tobacco consumption (kg)</i>		
		49	71			Never smoked	1.0	
						<125	1.1 (0.6-2.0)	
		20	21			125-250	1.8 (1.0-3.5)	
						>250	4.7 (2.4-9.1)	
34	141							
23	92							
24	51							
47	35							

**Table 2.33. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract combined**

Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95%CI)	Comments
Andreotti <i>et al.</i> (2006) Brazil 1999-2002	Oral cavity and pharynx analyzed together	16	134	Never smoked	1.0	OR adjusted
		56	160	Ex-smoker	2.9 (1.6-5.3)	
		252	173	Current smoker	12.1 (7.0-21.0)	
				<i>Smoking amount (pack-years)</i>		
		18	135	Never smoked	1.0	
		64	108	≤20	4.4 (2.5-7.9)	
		118	117	21-39	7.6 (4.3-13.2)	
	117	94	≥40	9.3 (5.3-16.4)		
Bosetti <i>et al.</i> (2008) Italy 1984-2000	Upper aerodigestive tract (oral cavity, pharynx, oesophagus and larynx) analyzed; Oral cavity and pharynx analyzed together	87	943	<b>All upper aerodigestive tract</b> Never smokers	0.12 (0.09-0.15)	Estimated from unconditional logistic regression with adjustment for age, study center, education, and alcohol drinking
		1514	1476	Current smokers	1.0	
		338	478	<i>Ex-smokers Time since cessation (years)</i> <10	0.70 (0.56-0.88)	
		155	489	10-19	0.58 (0.47-0.73)	
		95	391	≥20	0.27 (0.22-0.34)	
				<i>Age at cessation (years)</i>		
		40	248	<35	0.19 (0.13-0.27)	
		105	391	35-44	0.26 (0.21-0.34)	
		215	426	45-54	0.44 (0.36-0.53)	
		228	293	55-64	0.69 (0.56-0.86)	
				<b>Oral cavity and pharynx</b>		
		24	701	Never smokers	0.07 (0.05-0.11)	
		712	1176	Current smokers	1.0	
		144	383	<i>Ex-smokers Time since cessation (years)</i> <10	0.51 (0.40-0.65)	
		56	330	10-19	0.20 (0.14-0.28)	
		23	232	≥20	0.12 (0.08-0.20)	
				<i>Age at cessation (years)</i>		
13	162	<35	0.14 (0.08-0.26)			
45	279	35-44	0.20 (0.14-0.29)			
90	301	45-54	0.36 (0.27-0.48)			
75	203	55-64	0.48 (0.34-0.66)			

**Table 2.33. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract combined**

Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95%CI)	Comments					
Soya <i>et al.</i> (2007) India 2003-2006	Squamous cell carcinoma of upper aerodigestive tract	150	141	<i>Smoking, pack-years (PY)</i>		OR adjusted for age, gender, tobacco chewing and alcohol consumption					
				0	1.0						
				66	34		1-10	2.1 (1.1-4.0)			
				59	23		11-20	2.6 (1.3-5.4)			
				61	14		20-40	3.7 (1.7-8.0)			
				72	8		>40	7.9 (3.1-20.2)			
				<i>Tobacco chewers</i>			OR adjusted for age, gender, smoking and alcohol consumption				
				134	160			Never	1.0		
				84	34			Occasional	2.5 (1.5-4.2)		
				190	26			Regular	10.5 (6.3-17.3)		
				<b>GSTM1 present</b>				OR adjusted for age, gender, tobacco chewing and alcohol consumption			
				<i>Smoking, pack-years (PY)</i>							
				112	107				Non-smokers	1.0	
				49	30				1-10 PY	1.6 (0.8-3.2)	
				45	17				11-20 PY	3.2 (1.4-7.4)	
				40	12				21-40 PY	2.8 (1.2-6.5)	
				53	6				>40 PY	7.4 (2.6-21.4)	
				<i>Tobacco chewing</i>					OR adjusted for age, gender, smoking and alcohol consumption		
				111	125					Non-chewers	1.0
				56	27					Occasional	2.1 (1.2-3.8)
132	20	Regular	9.4 (5.3-16.6)								
<b>GSTM1 null</b>		OR adjusted for age, gender, tobacco chewing and alcohol consumption									
<i>Smoking, pack-years (PY)</i>											
38	31		Non-smokers	1.1 (0.6-2.1)							
16	6		1-10 PY	3.3 (1.1-10.4)							
15	6		11-20 PY	1.3 (0.4-4.0)							
21	3		21-40 PY	5.9 (1.5-23.1)							
19	2		>40 PY	7.8 (1.5-40.3)							
<i>Tobacco chewing</i>			OR adjusted for age, gender, smoking and alcohol consumption								
22	35			Non-chewers	0.84 (0.5-1.6)						
29	8			Occasional	3.6 (1.5-8.7)						
58	5			Regular	15.4 (5.8-41.0)						

**Table 2.33. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract combined**

Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95%CI)	Comments		
Soya <i>et al.</i> (2007) (contd)	Squamous cell carcinoma of upper aerodigestive tract	123 56 43 49 60  124 59 148  28 8 17 12 12  14 25 38  79 39 31 36 34  82 44 95	131 33 20 13 7  147 32 25  7 3 3 2 2  12 3 1  74 22 11 8 5  87 19 14	<b>GSTT1 present</b>				
				<i>Smoking, pack-years (PY)</i>				
				Non-smokers	1.0		OR adjusted for age, gender, tobacco chewing and alcohol consumption	
				1-10 PY	1.9 (1.0-3.5)			
				11-20 PY	2.3 (1.0-5.0)			
				21-40 PY	3.7 (1.7-8.2)			
				>40 PY	7.4 (2.7-19.7)			
				<i>Tobacco chewing</i>			OR adjusted for age, gender, smoking and alcohol consumption	
				Non-chewers	1.0			
				Occasional	1.8 (1.0-3.0)			
				Regular	8.3 (4.9-13.9)			
				<b>GSTM1 null</b>				
				<i>Smoking, pack-years (PY)</i>				OR adjusted for age, gender, tobacco chewing and alcohol consumption
				Non-smokers	3.9 (1.5-10.0)			
				1-10 PY	2.7 (0.6-11.8)			
				11-20 PY	5.5 (1.4-21.6)			
				21-40 PY	2.6 (0.5-13.7)			
				>40 PY	9.9 (1.1-87.6)			
				<i>Tobacco chewing</i>				OR adjusted for age, gender, smoking and alcohol consumption
				Non-chewers	1.1 (0.5-2.8)			
Occasional	9.5 (2.7-33.7)							
Regular	52.0 (7.0-393.3)							
<b>GSTP1 ile/ile</b>								
<i>Smoking, pack-years (PY)</i>				OR adjusted for age, gender, tobacco chewing and alcohol consumption				
Non-smokers	1.0							
1-10 PY	1.4 (0.7-3.0)							
11-20 PY	2.9 (1.1-7.4)							
21-40 PY	3.7 (1.4-9.8)							
>40 PY	5.6 (1.7-17.9)							
<i>Tobacco chewing</i>				OR adjusted for age, gender, smoking and alcohol consumption				
Non-chewers	1.0							
Occasional	1.9 (1.0-3.8)							
Regular	7.6 (3.9-14.8)							

**Table 2.33. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract combined**

Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95%CI)	Comments	
Soya <i>et al.</i> (2007) (contd)	Squamous cell carcinoma of upper aerodigestive tract	72	64	<b>GSTP1 ile/val or val/val</b>		OR adjusted for age, gender, tobacco chewing and alcohol consumption	
				<i>Smoking, pack-years (PY)</i>			
				Non-smokers			0.78 (0.5-1.3)
				1-10 PY			1.9 (0.8-4.8)
				11-20 PY			1.7 (0.7-4.4)
				21-40 PY			2.1 (0.7-5.9)
				>40 PY			7.8 (2.0-30.7)
				<i>Tobacco chewing</i>			
				Non-chewers			0.63 (0.4-1.1)
				Occasional			2.1 (1.1-4.3)
Regular		10.5 (5.1-21.6)					
Hashibe <i>et al.</i> (2007c) INHANCE consortium Europe, North America, South/Central America, International 1984-2006	Head and neck ICD-O-2/ICD-9/ICD-10	854	2577	<b>Never drinkers</b>		Random-effects model used. Study-specific odds ratios were adjusted for age, sex, race/ethnicity, education level, study center, years of cigar smoking, and years of pipe smoking	
				<i>Cigarette smoking</i>			
				Never			1.0
				Ever			2.13 (1.52-2.98)
				<i>Frequency, cigarettes/day</i>			
				Never smokers			1.0
				1-10			1.82 (1.28-2.59)
				11-20			2.36 (1.60-3.47)
				21-30			3.58 (2.09-6.16)
				31-40			4.46 (2.54-7.83)
				>40			2.69 (1.21-5.98)
				<i>Duration, y</i>			
				Never smokers			1.0
				1-10			1.45 (1.04-2.03)
				11-20			1.10 (0.75-1.61)
				21-30			1.79 (1.20-2.67)
				31-40			3.61 (2.26-5.75)
				>40			4.83 (3.18-7.33)
				<i>Cumulative smoking, py</i>			
				Never smokers			1.0
1-10		1.58 (1.13-2.22)					
11-20		1.85 (1.08-3.16)					
21-30		2.75 (1.71-4.43)					
31-40		4.06 (2.33-7.09)					
41-50		3.46 (1.97-6.09)					
>50		5.40 (3.06-9.53)					

**Table 2.33. Case-control studies on tobacco smoking and cancers of the upper aerodigestive tract combined**

Reference, Country and years of study	Cancer subsite	No. of cases	No. of controls	Smoking categories	Odds ratio (95%CI)	Comments
Hashibe <i>et al.</i> (2007c) (contd)	Head and neck ICD-O-2/ICD-9/ICD-10			<b>Oral cavity/pharynx</b>		Random-effects model used. Study-specific odds ratios were adjusted for age, sex, race/ethnicity, education level, study center, years of cigar smoking, and years of pipe smoking
				<i>Cigarette smoking</i>		
				Never	1.0	
				Ever	1.07 (0.50-2.28)	
				<i>Frequency, cigarettes/day</i>		
				Never smokers	1.0	
				1-10	1.55 (0.86-2.79)	
				11-20	1.08 (0.39-2.99)	
				21-30	2.68 (1.25-5.78)	
				31-40	5.46 (0.92-33.47)	
				>40	6.00 (1.48-24.29)	
				<i>Duration, y</i>		
				Never smokers	1.0	
				1-10	1.71 (0.62-4.74)	
11-20	2.35 (0.69-7.96)					
21-30	2.14 (0.94-4.86)					
31-40	2.07 (0.88-4.84)					
>40	2.56 (1.29-5.07)					
Applebaum <i>et al.</i> (2007) USA 1999-2003	Head and neck ICD-9 141, 143, 144, 145, 146, 148, 149 and 161			<b>Without HPV16 serology</b>		Models also controlled for sex, age, race, and education
				<i>Smoking, pack-years</i>		
				None	1.0	
				>0 to <20	1.2 (0.8-1.7)	
				20 to <45	1.7 (1.2-2.6)	
				≥45	3.0 (2.0-4.6)	
				<b>With HPV16 serology</b>		
				<i>Smoking, pack-years</i>		
				None	1.0	
				>0 to <20	1.1 (0.7-1.7)	
				20 to <45	1.8 (1.2-2.7)	
				≥45	3.4 (2.2-5.3)	