

Table 2.89. Description of case–control studies of the interaction of smoking and alcohol in the causation of cancer at various sites

Reference Place, year	Organ site	Cases	Controls	Definition of exposure	
				Tobacco	Alcohol
Castellsagué <i>et al.</i> (1999) Argentina, Brazil, Paraguay, Uruguay, 1986-1992	Oesophagus	655 men, 175 women, histologically confirmed squamous cell carcinoma of the oesophagus (in Paraguay, a cytological or radiological diagnosis of esophageal cancer was also acceptable)	1407 men, 372 women, selected in the same hospitals where the cases were identified, matched by sex, age (within 5 years), hospital, admitted in the hospital during the same period as the corresponding case	Ever/Never (No definition criteria of never- smokers)	Ever/Never (No definition criteria of never- drinkers)
Hayes <i>et al.</i> (1999) Puerto Rico, 1992-1995	Mixed upper aerodigestive tract (UADT)	298 men, 69 women, aged 21 to 79 years, with cancer of oral cavity (excluding lip and major salivary glands) and pharynx (excluding nasopharynx) taken together	Controls selected from residents of Puerto Rico. For cases younger than 65 years old controls selected from dwelling unit enumeration and matched by age and gender. For subjects aged 65 years and over, controls were selected from the Health Care Financing Administration matched by age and gender	Smokers were persons who had smoked at least 100 cigarettes in their lifetime. Lifetime consumption of cigarettes was estimated from usual daily consumption of cigarettes and total years of use	Drinkers were persons who had at least 12 drinks of any kind of alcohol in their lifetime. Lifetime alcohol consumption was estimated from usual weekly intake of alcoholic drinks (with each drink equivalent to 1.5 ounces of liquor, 4 ounces of wine, or 12 ounces of beer) and total years of use.
Talamini <i>et al.</i> (2002) Italy, Switzerland, 1992-2000	Larynx	478 men, 49 women, squamous cell carcinoma of larynx	1027 men, 245 women, admitted by acute illness in the major hospitals of the same geographical areas of cases, matched on quinquennia of age, sex, area of residence	In cigarettes per day Ever-smokers were subjects who had smoked at least one cigarette per day for at least 1 year	In drinks (about 12 g of ethanol) per week Never-drinkers were individuals who had abstained from any alcohol beverage lifelong
Znaor <i>et al.</i> (2003) India, 1993-1999	Oral cavity	1563 men with oral cavity cancer, histologically confirmed	1711 men with non-tobacco-related cancers (ICD 152-154, 156, 158, 170, 171, 173, 175, 185, 187, 190) from the same centers of cases and 1927 men healthy hospital visitors	No Yes (Ever-smokers or ever-chewers [T– without tobacco; T+ with tobacco] were defined as those who smoked or chewed at least once a day for a minimum period of 6 months)	No Yes (Ever-drinkers were defined as those who consumed alcohol at least once a day for a minimum period of 6 months)
	Pharynx	636 men with pharynx cancer, hystologically confirmed			
	Oesophagus	566 men with oesophagus cancer, hystologically confirmed			
Ramroth <i>et al.</i> (2004) South-West Germany 1998-2000	Larynx	236 men, 21 females with larynx cancer histologically confirmed	702 men, 67 women selected randomly from the population registries of the study areas, frequency matched for age and sex	Never-smokers Smokers (Categories of pack-years: >0-10; >10-20; >20-40; >40-80; >80)	Average daily alcohol consumption categories in grams of ethanol: 0-25; >25-50; >50-75; >75-100; >100-150; >150

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Castellsagué <i>et al.</i> (2004) Spain, 1996-1999	Oral cavity	304 men, 71 women (oral cavity and/or oropharyngeal cancer)	304 men, 71 women, hospital controls matched with cases by gender and quinquennia age-frequency.	Average number of cigarettes smoked per day	Average number of drinks consumed per day. Millimeters of pure ethanol were converted into drinks by applying a factor 1/18 (i.e., one drink would approximately contain 18 ml – or 14.4 grams – of pure ethanol). One drink would approximately correspond to one glass of 150 cc of wine, to one beer of 330 cc, or to one drink of hard liquor of 36 cc.
Lee <i>et al.</i> (2005) Taiwan 1996-2003	Oesophagus	468 men, 45 women with oesophagus cancer, hystologically confirmed	752 men, 66 women, from the same geographic areas as cases. They were chosen from healthy community residents who attended the hospitals for routine physical checkups in the same hospitals. They were selected within 4 weeks after each esophageal cancer patient was identified and matched to case by sex and age (within 3 years)	No Smokers/Chewers (Ever-smokers were subjects who had smoked 10 cigarettes or more for at least 6 months; ever-chewers were subjects who had chewed one betel nut, measured as quid, or more per day for >6 months.	No Drinkers (Ever-drinkers were subjects who had consumed any alcoholic beverage, including beer, wine or distilled spirits, at least once per week for a minimum of 6 months)
Peters <i>et al.</i> (2005) USA, 1999-2003	Mixed upper aerodigestive tract (UADT)	375 men, 146 women (squamous cell cancer of the head and neck: oral cavity, pharynx and larynx)	430 men, 169 women, population-based from greater Boston population frequency matched to cases by age, gender and town of residence.	Non-smokers: subjects who had smoked 0 pack-years or <100 cigarettes in their lifetime Cumulative consumption in pack-years	Non-drinkers: subjects who consumed zero drinks of alcohol per week. Number of alcohol drinks consumed per week estimated by the average lifetime weekly beer, wine, and liquor consumption
Peters <i>et al.</i> (2006) USA, 1999-2003	Mixed upper aerodigestive tract (UADT)	503 men, 189 women (head and neck squamous cell carcinoma: oral, pharynx and larynx)	541 men, 212 women, population controls, frequency matched (1:1) to cases by age (within 3 years), gender, and town of residence	Pack-years	Drinks weekly
Wu <i>et al.</i> (2006) Taiwan	Oesophagus	165 men (age range: 35-92 years) oesophageal squamous cell carcinoma histologically confirmed.	255 men (age range: 40-92 years) selected from patients who had visited the Otolaryngology Outpatient or Inpatient Department of Kohsinung Medical University Hospital and matched with case by age.	No Smokers/Chewers (subjects who had smoked 1 cigarette or more per day for at least 1 year were defined as ever-smokers; subjects who had chewed one betel nut or more per day for at least 1 year were defined as ever-chewers).	No Drinkers (subjects who had drunk an alcoholic beverage, including beer, liquor, wine or Chinese herd wine, more than four times a week for at least 1 year were defined as ever-drinkers)
Applebaum <i>et al.</i> (2007) USA,	Mixed upper aerodigestive tract (UADT)	360 men, 125 women (head and neck squamous cell carcinoma: oral,	402 men, 147 women, population controls, matched to cases on sex, age (within 3 years) and town of	Pack-years	Drinks weekly

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1999-2003 Hashibe <i>et al.</i> (2007) Romania, Poland, Russia 2000-2002	Oesophagus	pharynx and larynx)	residence		
		170 men, 22 women (squamous cell carcinoma of oesophagus); 31 men, 4 women (adecarcinoma of oesophagus)	846 men, 268 women, selected from in-patients and out- patients in the same hospital as the cases. Only controls with a recent diagnosis from a defined list of diseases unrelated to tobacco and alcohol were included. In Moscow, the controls were frequency matched to the cases by age, sex, center and referral or residence area. In the other centers, controls overlapped with those for a case-control study on lung cancer conducted according to an identical protocol, excluding controls interviewed more than 6 months before the beginning of recruitment of esophageal cancer cases.	No Yes (Ever-smokers were defined as having smoked at least 100 cigarettes in an entire lifetime, or having regularly smoked cigars/cigarillos or pipes)	No Yes (Ever-drinkers were defined as having ever consuming alcoholic drinks).
Lee <i>et al.</i> (2007) Taiwan 1996-2005	Oesophagus	600 men, 52 women, squamous cell carcinoma of oesophagus histologically confirmed	1038 men, 89 women, recruited from patients of the same hospitals as cases, matched by sex, age (within 3 years) and date of hospitalization (within 4 weeks after each case was identified)	No Yes (Tobacco-smokers and betel quid-chewers were defined separately as subjects who had smoked ten or more cigarettes and had chewed one or more betel nut (measured as quid) per day for at least 6 months. The number of pack-years was calculated by multiplying the amount of the substances consumed per day [20-cigarette packs per day for smoking or 10-betel quid packs per day for chewing] by the years of the substance used.	No Yes (Alcohol-drinkers were defined as participants who had consumed beer, wine, liquor, or hard liquor beverages at least once per week for a minimum of 6 months. The intake of ethanol in grams-per- drinking-day was estimated by multiplying the average total amounts of beverage drunk in a drinking day by the ethanol content contained in each type of beverage.

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Muwonge <i>et al.</i> (2008) India, 1996-2004	Oral cavity	163 men, 119 women (oral cancer from a randomized screening trial study)	815 men, 595 women; selected from the non-cancer individuals enumerated in the screening round in which the case was diagnosed; matched to cases on sex, age (within 1 year), panchayats (municipal administrative units in rural areas of India) and response status (that is if they were interviewed or not at the particular round and at the previous rounds for the cases diagnosed in the second and third screening rounds)	Never (individuals who had never engaged in any type of tobacco smoking; or any type of chewing) Ever (those who had smoked the classical industrial cigarettes or bidi, locally made cigarette containing 0.5g of coarse tobacco dust rolled in a dried temburni leaf; pan chewers, those who chewed a quid consisting of betel leaves, areca nut and aqueous lime and chewers of pan with tobacco, those who used the quid with an additional ingredient of locally cured tobacco leaves plus or minus stems)	Never (individuals who had never consumed any type of alcohol) Ever (those who consumed either “toddy”, a locally fermented distilled sap from palm trees, another locally brewed liquor called “arrack”, approximately 40% ethanol, or foreign liquor, locally made liquor similar to that brewed in western countries, or a combination of at least two of the above types)
Hashibe <i>et al.</i> (2009) Central and Occidental Europe, Latin America, North America, 1992-2006	Oral cavity	2993 men and women (oral cancer)	11611 men, 4557 women, population and hospital controls, frequency matched to cases on age, sex, and additional factors (study center, hospital, race/ethnicity)	Cigarettes per day	Drinks per day
	Pharynx	4038 men and women (pharynx cancer)			
	Larynx	2959 men and women (larynx cancer)			
	Mixed upper aerodigestive tract (UADT)	8965 men, 2256 women (head and neck cancer: oral, pharynx and larynx)			
Pandeya <i>et al.</i> (2009) Australia 2002-2005	Oesophagus	1036 men, 538 women of adenocarcinoma of oesophagus; 327 men, 35 women of esophageal-gastric junction adenocarcinoma; 367 men, 56 women of oesophageal squamous cell carcinoma.	Population controls were randomly selected from the Australian Electoral Roll, frequency-matched with cases by age (within 5 years) and state of residence. Women controls were oversampled intentionally at all ages to accommodate their simultaneous enrollment in a parallel case–control study of ovarian cancer.	Current smoking status classified as Never, Former and Current smokers, but no criteria information informed	Never-drinkers and intake in grams per week