Table 2.2 Case-control studies of painters and lung cancer

Reference, Location, Time period	Characteristics of cases	Characteristics of controls	Exposure Assessment	Exposure	No. of exposed cases	OR (95% CI)	Adjustment for potential confounders	Comments
Wynder & Graham (1951) USA	Subset of 200 cases from a Hospital Chest Service from a total of 709 US male cases of confirmed cases with epidermoid, undifferentiated or unclassified lung cancer	200 controls with a chest disease other than lung cancer from the Hospital Chest Service	Lifetime occupational history from interview	Painter ≥ 5 years within the last 40 years	11	[5.76 (1.41-23.44)]	None	The chest diseases were not specified. Only 2 painters were nonsmokers (smoked < 1 cigarette/day for >20 years). Cases and controls were of similar age and economic status.
Breslow *et al*. (1954) USA 1949-52	518 patients with histologically confirmed lung cancer from 11 hospitals	518 hospital controls matched by hospital, age, sex, race; excluded admission of lung cancer or a chest disease	Interview	Construction and maintenance painters for ≥5years	22	[1.87 (0.93-3.77)]	Hospital, age, sex, race	
				Painters, except construction and maintenance for ≥ 5 years	3	[0.50 (0.14-1.82)]		
Viadana *et al*. (1976); Decouflé *et al*. (1977); Houten *et al*. (1977) USA 1956-65	Lung cancer cases (ICD7 162, 163) from 11591 white male cancer cases at a treatment center, age ≥ 14 years	Non-cancer admissions from the same cancer treatment center	Lifetime occupation recorded during interview before diagnosis, coded using the Standard Industrial Classification Manual	Painter				Unexposed, clerical occupations
				Ever	42	1.71 [1.08-2.77]	age	
				Ever (smoking adj)	42	1.90 [1.32-2.48]	smoking, age	
				< 60 yrs old	21	2.12 [1.08-4.18]		
				≥ 60 yrs old	21	1.42 [0.74-2.73]	age	
				Worked ≥ 5 yrs	29	1.31 [0.73-2.26]		
				< 60 yrs old	14	1.76 [0.75-4.16]		
				≥ 60 yrs old	15	1.03 [0.49-2.18]		

Table 2.2 Case-control studies of painters and lung cancer

Reference, Location, Time period	Characteristics of cases	Characteristics of controls	Exposure Assessment	Exposure	No. of exposed cases	OR (95% CI)	Adjustment for potential confounders	Comments
Williams et al (1977) USA 1969-1971	432 lung cancer cases that reported an occupation, 95% histologically confirmed	2173 patients with cancers other than lung, larynx, oral cavity, esophagus, bladder that reported an occupation	Main lifetime employment from survey questionnaire, coded using the 1970 census classification	Painting (men)	12	4.21 [1.40-12.65] ($p< 0.01$)	Age, race, education, education, tobacco, alcohol, geographic location	Painting included construction workers, paper-hangers, and pattern & model makers; The CI was estimated by doubling the variance.
Milne *et al*. (1983) USA 1958-62	925 lung cancer deaths (747 men, 178 women)	4880 deaths from other cancers (except pancreas, bladder, nasal, kidney, haematopoietic) that are not known to be strongly associated with occupational risk factors (reported as the "reduced control group")	occupation from death certificates, coded using the Bureau of Census Industrial and Occupational Classification System	Painter (men)	24	1.80 [1.09-2.98]	age	The sex distribution was not presented for the "reduced control group", used to reduce potential exposure bias; The CI was estimated by applying the ratio of reduced/ total controls to the observed cell counts reported for the total control group.
Coggon *et al*. (1986) United Kingdom 1975-80	738 male bronchial cancer cases, aged 18-54 yrs, identified from hospital and cancer registry records	1221 other cancers	Occupation from mailed questionnaire	Painters and decorators	20	1.3 [0.62-2.72]	age, smoking, residence, respondent	52.1% overall response rate; The variance was doubled to approximate an adjusted 95%CI. The unadjusted 95%CI was 0.78-2.18. Included in the analysis restricted to case-control studies but excluded from the combined meta-analysis because of possible overlap with OPCS (1986).

Table 2.2 Case-control studies of painters and lung cancer

Reference, Location, Time period	Characteristics of cases	Characteristics of controls	Exposure Assessment	Exposure	No. of exposed cases	OR (95% CI)	Adjustment for potential confounders	Comments
Kjuus *et al*. (1986) Norway 1979-83	176 male incident lung cancer cases (ICD 162-163), < 80 years; 99% response rate	176 age-matched hospital controls excluding those with physical or mental handicaps, poor general health, or diagnosed with chronic obstructive lung disease; 99% response rate.	Interview and worksite records for longest job held; coded using Nordic Classification of Occupations; Exposed if worked ≥3 years	Painting, paper-hanging (occupation)	5	1.7 (0.4 - 7.3)	Age, smoking	
				Paints, glues, lacquer (exposure)	17	1.2 (0.6 – 2.6)		
Lerchen *et al*. (1987) USA 1980-82	771 cases (333 men, 173 women) identified from a SEER tumor registry; Hispanic whites and whites ages 25-84 years; 89% response rate	771 controls (499 men, 272 women) from randomly selected phone numbers and Medicare rosters; frequency matched by sex, ethnicity, 10-year age category; 83% response rate	Interview for lifetime occupational history; jobs coded using the SIC or SOC	Ever construction painters (males)	9	2.7 (0.8 – 8.9)	age, ethnicity, smoking	Exposed, ever employed at least 1 year in an industry/occupation

Table 2.2 Case-control studies of painters and lung cancer

Reference, Location, Time period	Characteristics of cases	Characteristics of controls	Exposure Assessment	Exposure	No. of exposed cases	OR (95% CI)	Adjustment for potential confounders	Comments
Siemiatycki *et al.*(1987) Canada 1979-85	857 male cases (159 oat-cell, 359 squamous-cell, 162 adenocarcinoma, 177 other types)	Other cancers	Interview to obtain lifetime occupational history; painters coded using Canadian occupation classification	*Mineral spirit exposure*		**OR (90% CI)**	age, socio-economic status, ethnicity, cigarette smoking, blue/white collar	Of those exposed to mineral spirits, 21% were in construction trades (mostly painters) Excluded from meta-analysis because risk associated with occupation as a painter is not presented
				oat-cell	36	1.1 (0.8 – 1.4)		
				squamous cell	92	1.2 (1.0 – 1.5)		
				Long duration, high exposure	44	1.7 (1.2 – 2.3)		
				adenocarcinoma	37	1.0 (0.7 – 1.3)		
				other types	32	0.8 (0.6 – 1.1)		
				Construction workers (mainly painters)	NG	1.4 (NG)		
Levin *et al*. (1988) PR China 1984-85	733 incident male cases, aged 35-64, identified through the Shanghai Cancer Registry	760 age-matched population controls	Lifetime occupational history from interview, classified according to the Chinese population census	Ever painter	15	1.4 (0.5 – 3.5)	Age, smoking	***** The variance was doubled to approximate an adjusted 95%CI. #calculated using a fixed effects model
				duration (yrs)				
				0	718	1.0 (ref)		
				< 10	7	1.9 [0.36-16.60]*		
				10-19	2	2.8 [0.07-62.47]*		
				20-29	5	2.2 [0.26-26.67]*		
				$\geq$ 30	1	0.3 [0.01-5.81]*		
				> 10	8	[1.34 (0.26-6.92)]#		
				< 20	9	[2.35(0.44-12.47)]#		
				> 20	6	[1.18 (0.18-7.64)]#		

Table 2.2 Case-control studies of painters and lung cancer

Reference, Location, Time period	Characteristics of cases	Characteristics of controls	Exposure Assessment	Exposure	No. of exposed cases	OR (95% CI)	Adjustment for potential confounders	Comments
Ronco *et al* (1988) Italy 1976-80	126 men who died from lung cancer; 77% participation rate	Random sample of 384 men who died from causes other than from smoking-related or chronic lung diseases; matched by year of death and age (± 10 yrs); 78% participation rate	Lifetime occupational history from interview with next of kin; coded using ILO classification	Painter	5	1.33 (0.43 – 4.11)	age, year of death, smoking, other employment in suspect high-risk occupations	
Vineis *et al* (1988) USA 1970s and 1980s	2973 men from cancer registries, co-operating hospitals or death certificates, resident in selected areas of the states; response rate range: 70%-93%.	3210 men from hospital records, decedents, death certificate, licensed drivers, matched by characteristics varying from study to study, with age always included; response rate range: 63%-89%	Life-time occupational history obtained during interviews with subjects or next of kin, coded using SIC and 1970 Census Classification	Painters	201	1.1 (0.9–1.4)	Age, birth cohort, .smoking	Analysis of 5 case-control studies in Louisiana, Florida, Pennsylvania, Virginia and New Jersey. Unexposed group: selected occupations and industries without a well-established or suspected carcinogenic exposure; Studies analyzed: Correa *et al* (1984), Blot *et al* (1980, 1982, 1983), Schoenberg *et al* (1987)

Table 2.2 Case-control studies of painters and lung cancer

Reference, Location, Time period	Characteristics of cases	Characteristics of controls	Exposure Assessment	Exposure	No. of exposed cases	OR (95% CI)	Adjustment for potential confounders	Comments
Zahm *et al* (1989) USA 1980-85	4431 white male cases with histological type and grade recorded at Missouri Cancer Registry, residing in Missouri	11 326 white male non-lung cancer registrants from the same Registry and period, excluding cancers of lip, oral cavity, esophagus, lung, bladder, ill-defined or unknown sites	Occupation at the time of diagnosis abstracted from medical records, coded using US Bureau of Census classification	Painters, paper hangers, plasterers <60 yrs of age	37 NG	2.0 (1.2–3.3) 3.2 (1.1–10.0)	Age, smoking	
Bethwaite *et al* (1990) New Zealand 1980-84	4224 male cases had known occupation among 5031 cases identified from the New Zealand Cancer Registry, aged 20 or more at registration; % microscopic confirmation not given	15 680 male non-lung cancer registrants with known occupation, [out of 19731 identified] from the same Registry and period, aged 20 or more at registration; % microscopic confirmation not given	Current/ most recent occupation as recorded at the time of registration and smoking history obtained through telephone interview, coded using New Zealand Standard Classification of Occupations	Painter decorators, steel and other construction painters, car painters, spray painters, signwriters, other unclassified painters	88	1.12 (0.93–1.52)	Age	

Table 2.2 Case-control studies of painters and lung cancer

Reference, Location, Time period	Characteristics of cases	Characteristics of controls	Exposure Assessment	Exposure	No. of exposed cases	OR (95% CI)	Adjustment for potential confounders	Comments
Burns & Swanson (1991) USA 1984-87	5935 (3918 males, 2017 females; 77% white, 23% black) from Occupational Cancer Incidence Surveillance System/Metropolitan Detroit Cancer Surveillance System, aged 40-84 years; response rates: 94% for cases and 95% for controls	3956 (1981 males, 1975 females) with colon and rectum cancer, registry-based	Life-time occupational history obtained during telephone interviews to the subjects or to their surrogates, coded using US Bureau of Census classification.	Painters (usual occupation, grouped)	97	1.96 (1.23–3.13)	Age at diagnosis, race, smoking, gender	Interviews to surrogates: 53.7% for cases, 27.5% for controls.
				Painting & spray painting machine operators (male, usual occupation, detailed occupational code)	37	4.5 (1.7–11.8)	Age at diagnosis, race, smoking	Unexposed group: selected occupations and industries with little or no exposure to carcinogens. Proportion of histologic confirmation not given; 93.4% overall response rate
Siemiatycki (1991) Canada 1979-85	857 incident male cases; aged 35-70 yrs; histologically confirmed; 79% response rate	533 population controls, 1360 cancer controls; 72% response rate;	Interview to obtain lifetime occupational history; painters coded using Canadian occupation classification	*Construction painter*			Age, family income, ethnicity, respondent type, cigarette & alcohol index,	The ORs were higher and the 90% CIs were narrower when restricted to lung squamous cell cancers.
				Any exposure	26	1.4 [0.77-2.17] (90% CI, 0.8-2.3) **OR (90% CI)**		
				Substantial exposure	14	1.7 (0.8-3.4)		

Table 2.2 Case-control studies of painters and lung cancer

Reference, Location, Time period	Characteristics of cases	Characteristics of controls	Exposure Assessment	Exposure	No. of exposed cases	OR (95% CI)	Adjustment for potential confounders	Comments
Morabia *et al* (1992) USA 1980-89	1793 male cases from 24 hospitals; 100% confirmed by histology; response rate not given. Number of cases that were painters not given.	3228 controls not hospitalized for lung cancer but including tobacco related conditions; matched by age, race, hospital, smoking history, admission date; response rate not given.	Standardized questionnaire, administered during a face to face interview. Only "usual" occupation recorded, plus exposure circumstances to up to 2 agents out of a list of 44 (study period 1980-4), or up to 6 agents (study period 1985-9); Jobs coded using US Bureau of Census classification	Painters	[13]	0.8 [0.32-2.03]	Age, geographic area, race, smoking, study period	The variance was doubled to approximate an adjusted 95%CI. The unadjusted 95%CI was 0.41-1.54.

Table 2.2 Case-control studies of painters and lung cancer

Reference, Location, Time period	Characteristics of cases	Characteristics of controls	Exposure Assessment	Exposure	No. of exposed cases	OR (95% CI)	Adjustment for potential confounders	Comments
Notani *et al* (1993) India 1986-90	246 male patients from Tata Memorial Hospital in Bombay; age not given; 98% histologically confirmed	212 male hospital-based controls diagnosed with cancers of the mouth (n =160) and oro- or hypo-pharynx (n=27), and non-cancerous oral disease (n=25), frequency matched by age and community; age not given	Interviewer-administered questionnaire with life-time occupational history.	Ever painters	6	1.62 (0.4–7.0)	Age, community, smoking (two groups)	Descriptive characteristics and response rate for cases and controls not given. Further analysis for painters using a "not-exposed" group of watchmen, policemen, semi-skilled/unskilled workers, office workers, teachers, salesmen, small business employees resulted in an OR of 1.84 (95% CI, 0.4-8.5)

Table 2.2 Case-control studies of painters and lung cancer

Reference, Location, Time period	Characteristics of cases	Characteristics of controls	Exposure Assessment	Exposure	No. of exposed cases	OR (95% CI)	Adjustment for potential confounders	Comments
Swanson *et al* (1993) USA 1984-87	3792 males (2866 white, 926 black) from Occupational Cancer Incidence Surveillance System/Metropolitan Detroit Cancer Surveillance System (participant in SEER), aged 40-84 years; 100% histologically confirmed.	1966 males (1596 white, 370 black) with colon and rectal cancer, registry-based; 100% histologically confirmed.	Life-time occupational and smoking history obtained during telephone interviews with subjects or their surrogates. Jobs coded using US Bureau of Census classification	Painting machine operators: White males *Employment (years)*			Age at diagnosis, pack-years of cigarette smoking	Interviews with surrogates: 56.1% for cases, 29.5% for controls; Unexposed group: selected occupations and industries with little or no exposure to carcinogens. > 90% overall response rate; This paper does not represent an independent set of cases and controls, but is a re-analysis of a sub-group reported in the study of Burns & Swanson (1991). Therefore it was omitted from the overall meta-analysis but kept for the analysis by duration. *Calculated using a fixed effects model.
				0	88	1.0		
				1-9	23	1.1 (0.5–2.4)		
				10-19	6	0.6 (0.2–2.2)		
				20+	17	3.9 (1.2–13.0)		
				Black males *Employment (years)*				
				0	12	1.0		
				1-9	17	1.5 (0.4–5.6)		
				10-19	7	9.9 (0.9–109.2)		
				20+	10	8.7 (0.9–89.3)		
				p for trend		≤ 0.05		
				Black and White				
				<10 yrs	40	[1.19 (0.61-2.34)]*		
				≥10 yrs	40	[2.23 (1.05-4.73)]*		
				<20 yrs	53	[1.15 (0.65-2.04)]*		
				≥20 yrs	27	[4.62 (1.61-13.31)]*		

Table 2.2 Case-control studies of painters and lung cancer

Reference, Location, Time period	Characteristics of cases	Characteristics of controls	Exposure Assessment	Exposure	No. of exposed cases	OR (95% CI)	Adjustment for potential confounders	Comments
Wu-Williams et al. (1993) PR China 1985-87	965 female incident lung cancer cases identified from cancer registries; aged 29-70 years	959 female population controls frequency matched by age to the expected age distribution in cases	Interviewer-administered questionnaire with life-time occupational history. Classified by industry and occupation according to the 1982 Chinese Population Census	Painters (all) Yrs employed 1-10 11+ Non-smoking painters Squamous/small cell Adenocarcinoma	39 19 20 15 15 12	1.6 (0.9-2.8) 1.9 (0.9-4.0) 1.4 (0.7-2.9) 1.3 (NG) 1.9 (1.0-3.8) 1.7 (0.8-3.4)	Smoking, study area, age, education Study area, age, education Smoking, study area, age, education	Women only; study conducted in Shenyang and Harbin, China where most women have worked outside of the home.
Finkelstein. (1995) Canada 1979-88	967 men who died of lung cancer, aged 45-75 yrs, residing in the study areas	2821 men who died of any cause other than lung cancer, matched by age, year of death, and city of residence	Occupation (job and industry) as reported on the death certificate	Painters & plasterers	16	1.25 (0.63–2.36)	Age, year of death, city of residence	No information was available on smoking
De Stefani *et al* (1996) Uruguay 1993–94	270 male patients from five major hospitals in Montevideo, aged 30-75 years	383 male hospital-based controls: other cancer sites except oral cavity, pharynx, oesophagus, stomach, larynx and bladder.	Interviewer-administered questionnaire with life-time occupational history.	Ever painters *Employment (years)* 1–20 21+ Squamous cell Small cell Adenocarcinoma	18 12 4 2	1.2 (0.6–2.4) 0.9 (0.2–3.0) 1.4 (0.6–3.1) 1.5 (0.6–3.4) 2.8 (0.8–9.9) 0.5 (0.1–2.5)	Age, residence, education, tobacco smoking (pack-years), alcohol consumption	Descriptive characteristics and separate response rates for cases and controls were not given; Overall response rate for all cancer sites 97.4%

Table 2.2 Case-control studies of painters and lung cancer

Reference, Location, Time period	Characteristics of cases	Characteristics of controls	Exposure Assessment	Exposure	No. of exposed cases	OR (95% CI)	Adjustment for potential confounders	Comments
Jahn *et al* (1999); Bruske-Hohlfeld *et al* (2000) Germany 1988-93, 1990-96	686 women, ≤ 75 yrs of age at diagnosis, of German nationality; 3498 men, ≤ 76 yrs of age at diagnosis, living in Germany for at least 25 years, resident in the study region; 100% confirmed by histology or cytology. Response rate 63% BIPS, 77% GSF [73% overall]	712 female and 3541 male population controls randomly selected from population registries or by random digit dialing, individually (BIPS study in Bremen area and Frankfurt/Main area) or frequency (GSF study in Nordrhein-Westfalen, Rheinland-Pfalz and Bayern, Saarland, Thuringen, and Sachsen) matched to cases by sex, age, and region. Response rate 60% BIPS, 41% GSF [45% overall]	Standardized questionnaire with full occupational history and supplementary job-specific modules, administered during a face to face interview; jobs coded according to the classification of the German Statistical Office (Statistiches Bundesamt)	Ever painters (women) Ever painters/ lacquerers (men) Ever painters/ lacquerers (men and women)	13 147 [160]	3.0 (0.73–12.33) 1.42 (1.05–1.92) [1.47 (1.09-1.97)]*	Smoking, asbestos, education, age, region of residence	Low response rate among controls with potential for selection bias; frequency matched cases and controls of the GSF-study were post-hoc stratified according to the matching variables age, region ; *fixed effects model used to calculate a weighted average; These studies have substantial overlap with Kreuzer (2001, 2002) that presented results for painters in lifetime non-smoking men [2.31 (0.57-9.47)] and women (OR=1.2), respectively. BIPS study overlaps with Jöckel *et al*(1998)
Muscat *et al* (1998) USA 1978-96	365 black men and 185 black women with histologically confirmed lung carcinomas recruited from teaching hospitals	251 male and 135 female black patients admitted to teaching hospitals for conditions unrelated to tobacco use, matched by race, gender, 5 years age groups, month of	Interviewer-administered questionnaire. Only “usual” occupation and whether the job entailed regular exposure to an	Ever painters Men Men (no overlap) Women	[24] 30 [19] 5	[1.32 (1.30-1.35)]* 0.7 (0.3–1.1) [0.68 (0.29-1.59)] 1.8 (0.3–12.3)	Age, education, smoking	Response rate: over 90% overall (no specific rate by gender or case-control status given); The study partially overlaps with Morabia *et al* (1992) and thus some estimations were used to eliminate the overlap in men

Table 2.2 Case-control studies of painters and lung cancer

Reference, Location, Time period	Characteristics of cases	Characteristics of controls	Exposure Assessment	Exposure	No. of exposed cases	OR (95% CI)	Adjustment for potential confounders	Comments
Muscat et al (1998) Contd.		diagnosis	occupational exposure (for a minimum of 8 hours a week) was obtained from interviews with subjects or their next of kin or death certificates					and the estimated variance was doubled to approximate an adjusted CI; *fixed effects model used to calculate a weighted average
Wünsch-Filho *et al* (1998), Brazil 1990-91	398 cases (307 men, 91 women) from 14 hospitals, living in the metropolitan area of Sao Paulo; 100% confirmed by histology or cytology	860 controls (546 men, 314 women) hospitalized for non-tobacco related conditions, matched by age, sex, hospital	Standardized questionnaire with full occupational history, administered during a face to face interview	Ever painters (men) *Employed* ≥ 10 years ≥ 10 years and latency ≥ 40 years	128 82 70	0.77 (0.56–1.08) 1.29 (0.79–2.11) 1.28 (0.77–2.15)	Age, sex, hospital, smoking, cancer in family, migration history, socioeconomic status	
Pezzotto & Poletto (1999) Argentina 1992-98	367 male newly diagnosed primary lung cancer patients from three medical institutions of Rosario City; mean age 60.3 ± 9.5; 100% histologically confirmed	586 hospital based males controls admitted for a non-smoking related disease at the same hospitals for traumatic conditions, urological diseases, acute surgical conditions, and other illnesses, matched by age (± 3 years); mean age 60.1 ± 10.2 yrs	Standardized questionnaire with lifetime occupational history for each job held > 1 year.	House painters Squamous cell Adenocarcinoma	4 2 1	2.4 (0.4–19.4) 3.3 (0.4–52.9) 1.3 (0.1–30.7)	Age, smoking habit, lifelong cigarette consumption	Unexposed group: never employed in occupations involving exposure to agents classified in group 1, 2A or 2B of the IARC Monographs. Individuals who had more than two jobs were excluded from the study.

Table 2.2 Case-control studies of painters and lung cancer

Reference, Location, Time period	Characteristics of cases	Characteristics of controls	Exposure Assessment	Exposure	No. of exposed cases	OR (95% CI)	Adjustment for potential confounders	Comments
Matos *et al.* (2000) Argentina 1994-96	200 male cases from four hospitals in Buenos Aires, residing in the town or province of Buenos Aires; 94.5% confirmed by histology or cytology; response rate 93%	397 male controls hospitalized for non-tobacco related conditions, residing in the town or province of Buenos Aires, matched by hospital and age; response rate 99%	Face to face interview using standardized questionnaire for full occupational history, coded using ISCO/ISIC; Further details requested for occupations held > 1 year.	Ever painters general blowtorch	16 8	1.2 (0.5–2.4) 1.4 (0.5–4.4)	Age, hospital, smoking (pack-years), other occupations with significant ORs (p<0.05)	
Pohlabeln *et al* (2000) Germany, Italy, Portugal, Sweden, UK, France and Spain 1988-94	650 non-smoking cases (509 women, 141 men) Recruited in12 centres in Germany, Italy, Portugal, Sweden, UK, France and Spain	1542 non-smoking controls (1011 females, 531 males); Community based controls in 6 centres, hospital controls (diseases not related to tobacco smoking) in 5 centres and both community and hospital-based controls in 1 centre.	In-person interview for lifetime occupational history, coded using ISCO and ISIC classification; non-smokers = subjects who smoked < 400 cigarettes during their lifetime	Ever painters (men)	6	1.84 (0.59–5.74)	Age, centre	This is the only case-control study of non-smokers sufficiently large to study occupational exposures. Controlling for other confounders (occasional smoking, residence in urban/rural area, dietary habits, second hand smoke) did not change the estimate. There is a small overlap with Jahn *et al* (1999), Brüske-Hohlfeld *et al* (2000), Richiardi *et al* (2004)

Table 2.2 Case-control studies of painters and lung cancer

Reference, Location, Time period	Characteristics of cases	Characteristics of controls	Exposure Assessment	Exposure	No. of exposed cases	OR (95% CI)	Adjustment for potential confounders	Comments
Bouchardy *et al* (2002) Switzerland 1980-93	9106 men from cantonal Cancer Registries of Basel, Geneva, St Gall, Vaud and Zurich,, aged 25 or more (and 65 or less in St Gall and Vaud)	49028 male non-lung cancer registrants from the same registries and period	Longest, current or most recent occupation as recorded at the time of registration (main or best specified occupation in Zurich Registry), coded using the ASCR Classification of Occupations	Plasterers and painters (in the construction industry)	273	1.1 (1.0–1.3)	Age, registry, civil status, period of diagnosis, nationality, urban/rural residence, socioeconomic status, histological confirmation, information from death certificate only (cases)	OR adjusted for all variables except socioeconomic status was 1.4 (95% CI 1.2-1.6). Adjusting for SES may over-adjust for occupational risk factors but serve as a surrogate for smoking. Overall 95.1% microscopic confirmation for all sites.
Richiardi *et al* (2004) Italy 1990-92	956 men from active search in all hospitals of the study areas; aged less than 75; response rate: 86% in Turin, 72% in Eastern Veneto; all cases histologically or cytologically confirmed	1253 male population-based controls, matched by study area, 5-year age groups; response rate: 85% in Turin, 74% in Eastern Veneto	Lifetime occupational history obtained from interviewer-administered questionnaire, coded using ISCO and ISIC codes	Ever painters small cell carcinoma Construction painters Painters, n.e.c.	62 4 42 20	1.7 (1.1–2.8) 5.2 (1.2-23) 1.7 (1.0-3.0) 1.7 (0.8-3.7)	Age, study area, smoking (never, ex-, active smokers), number of job periods, education	OR adjusted for all variables but education 2.0 (1.4-3.3)

Table 2.2 Case-control studies of painters and lung cancer

Reference, Location, Time period	Characteristics of cases	Characteristics of controls	Exposure Assessment	Exposure	No. of exposed cases	OR (95% CI)	Adjustment for potential confounders	Comments
Baccarelli *et al* (2005) Russia 1993-98	540 (474 men, 66 women) autopsy cases from the St Petersburg central pathology laboratory, serving 88 state hospitals in the study area. Occupational records retrieved for all cases.	582 (453 men, 129 women) individuals with autopsy-based diagnoses of non-cancer and non-tobacco related conditions, frequency matched by sex, age, area, year of death (20 painters). Occupational records retrieved for all controls.	Lifetime occupational histories were obtained from personal records ("Green Book"), coded based on ISCO and ISIC classification	Ever painters *< 10 years* *≥ 10 years*	10 6 4	0.6 (0.3–1.4) 0.5 (0.2–1.5) 0.8 (0.2–3.0)	Age, sex, smoking	Post-mortem examinations were conducted in about 95% of decedents. Information on smoking was abstracted from medical records at local health centres, but neither the proportion of success nor the quality of data assessed were stated. Occupational histories from the "Green Books" are reported to be complete.
De Stefani *et al* (2005) Uruguay 1994–2000	338 male patients from four major hospitals in Montevideo, aged 30-89 years; response rate 96.8% (338 subjects); 100% histologically confirmed; restricted to lung adenocarcinomas.	1014 males hospitalized for conditions not related to tobacco smoking, matched by age, residence and urban/rural status; response rate 95.7%	Interviewer-administered questionnaire with life-time occupational history.	Ever painter *Employment (years)* 1–20 21+ *p for trend*	26	1.8 (1.0–3.1) 9.6 (2.6–36.0) 1.2 (0.6–2.2) 0.07	Age, residence, urban/rural status, education, smoking status and years since quitting and age at start, number of cigarettes per day.	Hospital controls: 20.3% eye disorders, 18.3% fractures, 17.9% abdominal hernias, 11.0% injuries, 7.9% acute appendicitis, 7.2% diseases of the skin, 5.8% varicose veins, 3.9% hydatid cyst, 2.9% blood disorders, 2.6% urinary stones and 2.2% osteoarticular disorders.

Table 2.2 Case-control studies of painters and lung cancer

Reference, Location, Time period	Characteristics of cases	Characteristics of controls	Exposure Assessment	Exposure	No. of exposed cases	OR (95% CI)	Adjustment for potential confounders	Comments
Zeka *et al* (2006) Czech Republic, Hungary, Poland, Romania, Russia, Slovakia, United Kingdom 1998-2002	223 never smoking cases (48 men, 175 women) diagnosed at participating centers; 20-74 years; lived in the study area for ≥ 1 year; 100% confirmed by histology or cytology; 86% participation rate	1039 non-smoking controls (534 men, 505 women); selected from patients that did not have malignant neoplasms, respiratory diseases, or other smoking related disorders or selected from healthy individuals in the general population (Warsaw, Liverpool only); 85% participation rate	In-person interview to obtain lifetime occupational histories for jobs held ≥ 1 year; jobs coded by ISCO or NACE	Painters Men Women	6 0 6	[1.81 (0.72-4.59)] NG 1.8 (0.53-6.0)	None None sex, age, study center	Never smokers = smoked <100 cigarettes in lifetime; Painters were classified as working in construction, automotive industry and other users

NG, not given; OR, odds ratio; CI, confidence interval ; ASCR, Association of Swiss Cancer Registries; SIC, Standard Industrial Classification; SOC, Standard Occupational Classification; ISCO; ISIC; NACE, Nomenclature Générale des Activités Économiques dans les Communautés Européennes