

Table 2.13 Cohort studies on cancer of the lung and coffee drinking (web only)

Reference, location enrolment/follow-up period, study design	Population size, description, exposure assessment method	Organ site	Exposure category or level	Exposed cases/deaths	Risk estimate (95% CI)	Covariates controlled	Comments
Nomura et al. (1986) US 1965–1968 Cohort	7355; Japanese men living in Hawaii, born in 1990–1919 with complete follow-up and dietary questionnaires. Exposure assessment method: Questionnaire; 24-hour dietary recall history	Lung: incidence, histologically confirmed	Coffee (cups/day)			Age at examination, year of smoking, number of cigarettes smoked per day, smoking status at exam, past smoking status	95%CI not reported. Strengths: Prospective. Limitations: Based on only one d history of coffee intake. Lung cancer findings may be due to residual confounding by smoking as supported by the negative findings among non-smokers
			0	12	1		
			1–2	29	1.05		
			3–4	27	1.05		
			5+	42	1.44		
			Trend-test p-value: 0.19				
Jacobsen et al. (1986) Norway 1967–1969 to 1978 Cohort	16 555 (13 664 men, 2891 women); 2 cohorts of Norwegian men Probability sample of the entire male population A set of brothers of migrants to the US Exposure assessment method: Questionnaire	Lung: incidence	Coffee (cups/day)			Age, residence, smoking status or smoking cigs/day	95%CI not reported. Strengths: Prospective, incidence Limitations: Based on only one time of coffee intake
			≤ 2 cups/day	35	1		
			≥ 7 cups/day	27	1.82		
Stensvold and Jacobsen (1994) Norway Enrolment: 1977–1982, Follow-up until 1990 Cohort	42 973; 21 735 men and 21 238 women; age 35–54 years, participated in a cardiovascular screening in three counties of Norway. Exposure assessment method: Questionnaire	Lung	Coffee (cups/day)			Age, cigarette per day, and county of residence	Strengths: Complete follow-up by linkage of national data by national personal identification number. Limitations: Not able to adjust confounding food habit such as vegetable and fruit intake
			Men	93	-		
			≤ 4	17	1		
			5–6	22	1.4		
			≥ 7	54	2.4		
			Women	32	-		
≤ 4	8	1					

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			5–6	12	1.9		
			≥ 7	12	2		
Khan et al. (2004) Japan Enrolment: 1984–1985, Follow-up until 2002 Cohort	3158; 1524 men and 1634 women; 45 health centres located in the Hokkaido prefecture. 40+ year old persons of from the list of 1363 randomly selected households of 50 areas using residential register. Exposure assessment method: Questionnaire	Lung: lung cancer mortality	Frequency Men Less ≥ several times/week Women Less ≥ several times/week	41 NR NR 10 NR NR	- 1 0.7 (0.4–1.4) - 1 2.1 (0.5–8)	Men: age, smoking, Women: age, health status, health education, health screening, smoking	Strengths: population based, prospective Limitations: small number of cases Onetime assessment for exposure
Guertin et al. (2015) US Enrolment: 1995–1996, Follow-up until 2006 Cohort	457 366 subject available for analysis; 50–71 year old NIH-AARP Diet and Health Study American Association of Retired Persons, Six US states (California, Florida, Louisiana, New Jersey, North Carolina, Pennsylvania) Exposure assessment method: Questionnaire; 124 item FFQ Coffee consumption over the past year	Lung	All coffee (cups/day) None < 1 1 2–3 4–5 ≥ 6	510 987 1122 4022 1746 809	1 1 (0.9–1.11) 0.97 (0.88–1.08) 1.06 (0.97–1.17) 1.14 (1.03–1.26) 1.27 (1.14–1.42)	Age at study baseline, sex, current cigarette smoking status, number of cigarettes smoked per day, time of smoking cessation among former smokers, whether a participant ever smoked pipe/cigars	Strengths: large scale, prospective, large number of outcome. Ability to categorize decaffeinated or caffeinated. Limitations: coffee consumption is self-report, asking typical coffee consumption over the past year, lack data on cumulative exposure (coffee consumption is considered relatively stable over time.) Quantitative information on caffeine not available. 1/3

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		Lung	Caffeinated (cups/day)			Age at study baseline, sex, current cigarette smoking status, number of cigarettes smoked per day, time of smoking cessation among former smokers, whether a participant ever smoked pipe/cigars	cancer cases histologically unknown
			None	510	1		
			≤ 1	1059	0.93 (0.83–1.03)		
			2–3	2839	1.06 (0.96–1.17)		
			≥ 4	2004	1.18 (1.07–1.31)		
		Lung	Decaffeinated (cups/day)			Age at study baseline, sex, current cigarette smoking status, number of cigarettes smoked per day, time of smoking cessation among former smokers, whether a participant ever smoked pipe/cigars	
			None	510	1		
			≤ 1	903	1.02 (0.92–1.14)		
			2–3	1027	1.04 (0.94–1.16)		
			≥ 4	454	1.13 (1–1.29)		
			Trend-test p-value: 0.0003				
		Lung	Never smokers			Age at study baseline, sex	
			None	66	1		
			≤ 1	188	1.13 (0.86–1.47)		
			2–3	144	0.97 (0.74–1.29)		
			≥ 4	33	1.08 (0.74–1.58)		
			Trend-test p-value: 0.5569				

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		Lung	Current smokers (≤ 10 ($n = 16\ 382$))				Age at study baseline, sex, number of cigarettes smoked per day, time of smoking cessation among former smokers, whether a participant ever smoked pipe/cigars
			None	27	1		
			≤ 1	178	1.17 (0.78–1.76)		
			2–3	296	1.21 (0.81–1.79)		
			≥ 4	152	1.36 (0.9–2.04)		
			Trend-test p-value: 0.118				
		Lung	Current smokers (11–20 ($n = 26\ 081$))				Age at study baseline, sex, number of cigarettes smoked per day, time of smoking cessation among former smokers, whether a participant ever smoked pipe/cigars
			None	74	1		
			≤ 1	266	0.9 (0.69–1.16)		
			2–3	722	1.03 (0.81–1.31)		
			≥ 4	556	1.14 (0.89–1.45)		
			Trend-test p-value: 0.0022				
		Lung	Current smokers (21–40 ($n = 20\ 769$))				Age at study baseline, sex, number of cigarettes smoked per day, time of smoking cessation among former smokers, whether a participant ever smoked pipe/cigars
			None	72	1		
			≤ 1	217	0.98 (0.75–1.28)		
			2–3	637	1 (0.78–1.28)		
			≥ 4	750	1.18 (0.93–1.51)		
			Trend-test p-value: 0.0012				

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		Lung	Current smokers (> 40 (<i>n</i> = 2457))			Age at study baseline, sex, number of cigarettes smoked per day, time of smoking cessation among former smokers, whether a participant ever smoked pipe/cigars	
			None	11	1		
			≤ 1	37	1.28 (0.65–2.5)		
			2–3	85	1.2 (0.64–2.25)		
			≥ 4	145	1.38 (0.75–2.55)		
			Trend-test p-value: 0.2852				
Hashibe et al. (2015) US Enrolment: 1992–2001, Follow-up from 1998 until May 2011 Cohort	96 024 subjects for analysis; PLCO Cohort (Prostate, Lung, Colorectal, and Ovarian cancer screening trial) 55–74 year old Exposure assessment method: other; Coffee drinking for the last 12 months	Lung	Coffee intake (cups/day)			Age, sex, race, education, smoking status, smoking frequency, smoking duration, time since stopping smoking for past smokers	Strengths: prospective, large sample size Information on caffeine Limitations: Age at starting, duration and change of coffee drinking habits unavailable
			< 1	222	1		
			1–1.9	137	1.03 (0.83–1.27)		
			≥ 2	778	1.1 (0.94–1.28)		
			Per cup	NR	1.04 (1.01–1.07)		
			Trend-test p-value: 0.196				
Lukic et al. (2016) Norway 1998–2013 Cohort	98 405; random sample of Norwegian women aged 30–70 overall response rate: 52.7% Exposure assessment method: Questionnaire	Lung: (<i>n</i> = 819)	Total coffee consumption			Age, smoking status, age at smoking initiation, number of pack-year smoked, exposure to smoking in childhood, duration of education, body mass index, and physical activity level	Focus on cancer total and major site of cancer including lung Strengths: Population-based, large-scale, Questionnaire validated, Repeated measurements of coffee consumption and smoking exposure, and the use of updated information, High validity of coffee consumption,
			≤ 1 cup/day	NR	1		
			> 1–3 cups/day	NR	1.12 (0.86–1.44)		
			> 3–7 cups/day	NR	1.28 (0.99–1.65)		
			> 7 cups/day	NR	2.01 (1.47–2.75)		

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		Lung: never smokers	Total coffee consumption				Limitations: no information on caffeine status, preparation and brewing type. residual confounding from smoking
			≤ 1 cup/day	NR	1	Age, exposure to smoking in childhood, duration of education, body mass index, and physical activity level	
			> 1–3 cups/day	NR	1.24 (0.58–2.69)		
			> 3–7 cups/day	NR	1.58 (0.7–1.11)		
			> 7 cups/day	NR	1.42 (0.44–4.57)		
			Trend-test p-value: 0.3				
		Lung: ever smokers	Total coffee consumption			Age, smoking status, age at smoking initiation, number of pack-year smoked, exposure to smoking in childhood, duration of education, body mass index, and physical activity level	
			≤ 1 cup/day	NR	1		
			> 1–3 cups/day	NR	1.1 (0.84–1.45)		
			> 3–7 cups/day	NR	1.11 (0.85–1.47)		
			> 7 cups/day	NR	1.46 (1.1–1.94)		
			Trend-test p-value: 0.004				

CI, confidence interval; NR, not reported

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