

Risk of COPD in relation to type of cigarette smoked

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This is an updated version of a review conducted in 2004.

Table 1 summarizes information on the relative risk of COPD in relation to type of cigarette smoked for 7 studies, all from the USA, UK or Western Europe. Attention has been restricted to studies of death or hospitalization from COPD (or chronic bronchitis or emphysema), or an in-life diagnosis of COPD. Studies relating respiratory symptoms or lung function to type of cigarette are not included. Except that the Tang et al., 1995 results include some data considered separately by Hawthorne & Fry, 1978 the studies provide independent data.

The table provides information on:

1. First author and location - see references for the full author list;
2. Study design and period of deaths (or cases) - there are three study designs:  
CC = case-control, CS = cross sectional, P(D) = prospective study of deaths;
3. Comparison and test group - the comparison group has always been taken as plain rather than filter or the group with the highest tar, nicotine or tar/nicotine (T/N) for which data are available; the test group has conversely always been taken as filter rather than plain or the lowest yield available;
4. Sex - some studies only provide results for one sex or for sexes combined;
5. Numbers of deaths (or cases) - the number included in the specific comparison, on occasion estimated approximately;
6. RR (95% CI) - the relative risk and 95% CI comparing the test group (numerator) with the comparison group. Where a study provides estimates adjusted for various sets of adjustment factors, RRs and CIs are, if possible, presented (a) adjusted for as many factors as possible including cigarettes/day and (b) adjusted for as many factors as possible excluding cigarettes/day. RRs and CIs are sometimes given by age or other data subset, and have often had to be estimated (see notes);

7. Adjustment factors - see key at the end of the table; and
8. Notes - see key at the end of the table.

All the studies considered present estimates that are adjusted for age, cigs/day (or in one study pack-years) and possibly other factors also. Of these 11 relative risk estimates, 8 are below 1.00 (3 statistically significantly), 1 is equal to 1.00 and 2 are above 1.00 (neither significantly). Omitting estimates on a per mg tar reduction basis (which are not strictly comparable and in the case of the Tang study would lead to some double counting) the fixed-effects meta-analysis relative risk estimate is 0.74 (0.62-0.88), with some heterogeneity ( $\chi^2 = 21.0$  on 9 d.f.,  $p = 0.013$ ). The random-effects estimate is 0.70 (0.53-0.93).

Three studies provide sex-specific estimates unadjusted for cigs/day. Compared with the adjusted results, the unadjusted relative risk estimates are slightly lower in three cases (Lange/females, Alderson/females and Dean/males) but quite similar otherwise.

Relative risk of COPD in relation to type of cigarette smoked

First author (year)/location	Study design/ Period of deaths (or cases)	Comparison group	Test group	Sex	Number of deaths (or cases)/ diagnosis	RR (95% CI)	Adjustment factors	Notes
Hammond et al., 1976 and Lee & Garfinkel, 1960-72 1981, USA	P(D) 1960-72	High T/N	Low T/N	M F	107 43 Emphysema	0.78(0.53-1.14) 0.59(0.32-1.07)	age, cigs, race, ages, res, occ, educ, hlc, hhd	c, 1
Dean et al., 1977, NE England	CC 1971-72	Plain 1954, 1964, 1969	Filter 1954, 1964, 1969	M F	140 33 Chronic bronchitis	0.58(0.35-0.95) 0.39(0.23-0.66) 0.27(0.13-0.57) 0.25(0.12-0.53)	age, cigs none age, cigs none	c r, c c r, c
Hawthorne & Fry, 1978, WC Scotland	P(D) 1968-77	Plain	Filter	M	=20 Chronic bronchitis	0.72(0.29-1.79)	age, cigs, stud	c
Alderson et al., 1985, UK	CC 1977-82	Always plain	Always filter	M F	78 94 Chronic bronchitis	0.25(0.10-0.64) 0.26(0.10-0.66) 0.75(0.40-1.42) 0.67(0.36-1.28)	age, cigs none age, cigs none	c r, c c r, c
Petitti & Friedman, 1985 Oakland or San Francisco, USA	CS 1979-80	Risk per 5 mg tar decrease		M+F	81 COPD	1.00(0.90-1.10)	age, sex, race, cigs	-
Lange et al., 1992 Denmark	P(D) 1976-89	Plain	Filter	M F	66 34 COPD-related	1.20(0.70-2.00) 1.23(0.70-2.19) 1.30(0.60-2.60) 1.07(0.59-1.94)	age, pyr age age, pyr age	- r, c 2 r, c
Tang et al., 1995 4 UK studies	P(D) 1967-90	Risk per 15 mg tar decrease Current plain    Current filter		M	127 127 COLD	0.78(0.41-1.48) 0.94(0.64-1.37)	age, cigs, stud age, cigs, stud	- -

Key to adjustment factors

age = age  
ages = age started to smoke  
cigs = number of cigarettes per day  
educ = education

hhd = history of heart disease  
hlc = history of lung cancer  
occ = occupation  
pyr = pack-years

race = race  
res = area of residence  
sex = sex  
stud = study

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