

Table 2.1 Cohort studies of coal tar pitch and cancer

Reference, location, name of study	Cohort description	Exposure assessment	Organ site (ICD code)	Exposure categories	No. of cases/deaths	Relative risk (95% CI)*	Adjustment for potential confounders	Comments
Road Paving								
Bergdahl and Järholm (2003) Sweden	6150 male asphalt workers, mainly in road construction, cancer incidence through 1995	15% coal tar used before 1965, 0% by 1975	Lung	<i>Asphalt workers</i>		SIR	Swedish national comparison rates	
				started <1954	5	1.1 (0.4-2.5)		
				started 1955-1964	7	0.84 (0.3-1.7)		
				started 1965-1974	7	0.81 (0.3-1.7)		
Burstyn, et al. (2007) Denmark, Finland, Israel, Norway	7298 men employed 1913-1999 for ≥ 2 seasons of work in companies applying asphalt, cancer incidence 1968-2003 (Denmark), 1969-1994 (Finland), 1968-1998 (Israel), 1953-2005 (Norway)	Company work details + database of exposure measurements (from industry, not necessarily this cohort)	Bladder	<i>Average benzo(a)pyrene</i>		1.00	Age, calendar period, duration of employment, country 15 year lag p-trend=0.15	"Use of coal tar was the strongest determinant of exposure to benzo (a)pyrene"
				0-<99 ng/m ³	10	1.53 (0.54-4.38)		
				99-<139 ng/m ³	9	2.71 (1.01-7.27)		
				139-<204 ng/m ³	10	1.90 (0.66-5.47)		
				204+ ng/m ³	10	1.00		
				<i>Cumulative benzo(a)pyrene</i>		1.13 (0.44-2.9)		
0-<385 ng/m ³	10	1.67 (0.62-4.48)						
385-<883 ng/m ³	9	1.09 (0.30-3.99)						
883-<1755 ng/m ³	12							
1755+ ng/m ³	8							
							p-trend=0.63)	
Kauppinen, et al. (2003) Finland	5676 men employed ≥ 1 season by 6 road paving companies 1969-1994	4815 (85%) had no coal-tar exposure	Lung	<i>Coal tar exposure:</i>		SMR / RR	Finnish national comparison rates p-trend 0.05	SIR for exposure to coal tar not presented
				None	44	1.30 / 1.0		
				Very low (15 year lag)	4	2.06 / 1.49		
				Medium (15 year lag)	3	10.0 / 10.7		
Randem, et al. (2003) Norway	8763 male asphalt workers ever privately employed or state-employed ≥ 3 months, cancer incidence 1970-1997	Pre1965, coal tar constituted 0.5% of asphalt mass	Lung	<i>First employed</i>		SIR	Norwegian national comparison rates	Cohort missing possibly 50% of pre-1970 asphalt workers (discarded/missing company records)
				<1949	2	0.8 (0.1-2.8)		
				1950-1959	9	1.6 (0.7-3.0)		
				1960-1969	25	1.2 (0.8-1.8)		
				1970-1979	16	1.0 (0.6-1.6)		
				1980+	8	2.1 (0.9-4.0)		

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Stücker, et al. (2003) France	15,011 men ever employed ≥ 6 months from 1979 on by 2 paving and road construction companies, vital status through 31 March 1996	Coal tar used <1970	Lung	<i>Ever asphalt work</i>		SMR	French national comparison rates	
				Hired before 1970	9	1.17 (0.53-2.21)		
			Stomach	Hired after 1970	9	0.89 (0.40-1.68)		
				Hired before 1970	3	2.41 (0.48-7.04)		
			Bladder	Hired after 1970	3	1.97 (0.40-5.76)		
				Hired before 1970	0			
	Hired after 1970	1	1.04 (0.01-5.77)					