

**Table 2.1. Cohort studies of coke production workers and cancer**

Reference, location	Cohort description	Exposure assessment	Organ site	Exposure categories	No. of cases/deaths	SMR (95% CI)	Adjustment for potential confounders	Comments
Kennaway & Kennaway (1947), United Kingdom	Register-based national mortality analysis of all deaths in England and Wales 1921–38	Occupational title	Lung Larynx	Gas stokers and coke-oven chargers	85 37	284 [227–352] 213 [150–293]		
Buck & Reid (1956), United Kingdom	Deaths among coke workers of the National Coal Board from 1949 to 1954 were obtained from local or national registers. The population at risk was estimated from a census.	Job department	Respiratory cancer	Coke-oven workers	14	[140 (77–235)]		The validity of the study design and methods is questionable.
Sakabe <i>et al.</i> (1975), Japan	2178 coke-oven workers who retired 1947–73 were followed for mortality from 1949 to 1973.		Lung		15	129 [72–212]		The methods for tracing vital status among the retired workers was not reported.
Davies (1977), Wales, United Kingdom	601 coke production workers in active employment in 1954 at two plants were followed for mortality until 1965.	None	Lung		8	[82 (35–162)]		Follow-up period limited
Hurley <i>et al.</i> (1983), United Kingdom	6767 male manual workers from 14 British Steel Corporation works and 13 National Smokeless Fuels Ltd works in active employment in 1966–67 were followed for mortality until 1979.	Oven, part-oven, non-oven work. Duration of employment	Lung	Non-oven work Part-oven work Oven work	65 33 66	[93 (71–118)] [122 (84–172)] [99 (76–126)]		The period of follow-up was short.
Wu (1988), PR China	21 995 coke plant workers in the steel industry employed before 1965 were followed for mortality from 1971 to 1982.	Job department	Lung	Entire cohort Coke oven workers	93 40	[255 (206–313)] [497 (355–677)]		Description of methods insufficient
Swaen <i>et al.</i> (1991), The Netherlands	5659 male workers employed for at least 6 months at any of three plants in 1945–69 were followed for mortality up to 1984.	Job department (coke plant or by-product plant)	Lung Bladder Skin	By-product plant Coke oven By-product plant Coke oven By-product plant Coke oven	104 62 20 7 4 0	100 [82–121] 129 [99–165] 137 [84–212] 98 [39–202] 155 [42–397] –		

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Chau <i>et al.</i> (1993), France	536 manual workers who retired from two coke plants between 1963 and 1982 were followed for mortality up to 1987.	Work area	Lung	All areas	25	238 [154–351]		Adjustment for tobacco smoking by an indirect method gave ambiguous results.
				Coke ovens	2	175 [21–632]		
				Near ovens	8	252 [109–497]		
				By-product area	2	237 [29–856]		
				Workshops	6	433 [159–942]		
				Unexposed areas	6	228 [84–496]		
Franco <i>et al.</i> (1993), Italy	538 male production workers employed > 1 year in 1960–85 were followed for mortality up to 1990.		Lung		19	170 (102–265)		Use of local death rates for lung cancer reduced the SMR to a non-significant level
Costantino <i>et al.</i> (1995); Lloyd & Ciocco (1969); Lloyd <i>et al.</i> (1970); Lloyd (1971); Redmond <i>et al.</i> (1972); Redmond (1983) USA and Canada	5321 coke-oven workers from 12 plants in the USA and Canada in employment any time in 1951–55 (or for two plants, in 1953) were followed for mortality up to 1982.	Information on job histories, department, work tasks and occupational hygiene measurements were used to calculate the individual cumulative exposure to CTPV.	Lung	Years as coke-oven worker:			The use of other steel workers as a reference cohort may reduce the potential for bias due to tobacco smoking, and the clear exposure–response relationship precludes tobacco smoking as an explanation.	Especially high risks were noted among non-whites, who also held the most highly exposed jobs.
				0	203	1 (–)		
				1–5	39	1.33 (0.92–1.89)		
				5–9	18	1.37 (0.92–2.51)		
				10–15	26	1.82 (1.26–2.99)		
				15–19	47	2.91 (2.27–4.52)		
> 20	125	2.71 (1.76–2.85)						

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Bye <i>et al.</i> (1998), Norway	888 male workers employed > 1 year in 1962–88 were followed for mortality and cancer incidence up to 1993.	Individual job histories and personal exposure measurements for PAH	Lung	<i>Lung</i>	7	<b>SIR</b> 0.82 (0.33–1.70)		Lagged results
				Unexposed	5	0.76 (0.25–1.77)		
				Cumulative PAH ( $\mu\text{g}/\text{m}^3 \times \text{y}$ )				
				< 50	0	0 (1.1 expected)		
				50–149	0	0 (0.5 expected)		
			Stomach	$\geq 150$	2	4.82 (0.58–17.41)		
				<i>Stomach</i>	9	2.22 (1.01–4.21)		
				Unexposed	6	1.72 (0.63–3.74)		
				Cumulative PAH ( $\mu\text{g}/\text{m}^3 \times \text{y}$ )				
				< 50	1	2.74		
	50–149	1	7.40					
	$\geq 150$	1	12.61					

SMR, standardized mortality ratio; CI, confidence interval; CTPV, coal-tar pitch volatiles