

Table 2.4. Case-control studies of exposure to benzene and the risk for acute lymphocytic leukaemia (ALL)

Reference, study location and period	Characteristics of cases	Characteristics of controls	Exposure assessment	Organ site (ICD code)	Exposure categories	No. of exposed cases	Odds ratio (95% CI)*	Adjustment for potential confounders	Comments
Shu <i>et al.</i> (1988) PR China	331 cases of leukaemia (172 ALL) in children younger than 15 yr, diagnosed July 1974-June 1986 in the registry of the Shanghai Tumor Institute, 310 interviewed.	Selected by neighbourhood committees in a 2:1 ratio to cases, matched on sex and birth yr, 98% response.	Personal interviews of parents including maternal occupations and exposures during pregnancy	ALL 204.0	Maternal occupational exposure to benzene during pregnancy	8	1.3 (0.5–3.0)	Age, sex birth weight, birth order, born in rural area, prenatal and paternal preconception X-ray exposures, chloramphenicol and syntamycin usage and mother's age at menarche.	Referent group mothers who were office workers
					Maternal occupational exposure to gasoline during pregnancy	21	1.7 (1.0–3.0)		
Shu <i>et al.</i> , (1999) USA	1842 ALL cases from the Childrens Cancer Group and 1986 controls under the age of 15 (response 92% and 76%, respectively)	Random digit dialling, matched on age, race and telephone area exchange	Telephone interviews of parents, detailed occupational and self reported exposure information	ALL 204.1	Maternal exposure to benzene:			Maternal education. Race, family income	Referent group no maternal exposure to specific hydrocarbons
					Anytime	11	0.7 (0.3–1.6)		
					Preconception	7	0.7 (0.3–1.8)		
					During pregnancy	4	0.5 (0.1–1.6)		
Postnatal	7	0.6 (0.2–1.6)							

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Blair <i>et al.</i> (2001) USA	All cases of leukaemia in the cancer registry of Iowa between March 1981 and October 1983, and from a surveillance network of hospitals in Minnesota from October 1980 to September 1992. 578 of 669 men cases age 30 or more participated.	Population-based controls frequency-matched to cases by 5-yr age group, vital status at the time of the interview, and state of residence. 474 controls for cases less than 65 yr of age were selected by random digit dialing 519 controls for cases 65 yr or older were selected from listings provided by the Health Care Financing Administration, and 550 controls for deceased cases were selected from state death certificate files. Response rates 77–79%	Personal interviews of 340 cases and 278 surrogates of cases and 1 245 controls. Detailed occupational history, with job exposure matrix for specific exposures.	ALL 204.1	Benzene Low High	3 0	0.7 (0.2–2.5) -		Referent for OR not specified.

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Adegoke <i>et al.</i> (2003) PR China	532 residents of Shanghai age 15 yr or older reported with leukaemia to the Shanghai cancer registry June 1987-August 1989. 486 (91%) interviewed (81 ALL cases)	502 controls randomly selected from the General Population registry with the expected age and sex distribution of the cases. Response rate 94%.	Standardized personal interviews including occupational history and self-reported exposure to benzene.	ALL 204.1	Benzene exposure Never Ever < 15 yr ≥ 15 yr Trend	72 9 4 5	1.0 1.5 (0.7–3.3) 0.8 (0.3–2.4) 3.9 (1.3–11.8) P = 0.12	Age, sex and income	

ALL, acute lymphocytic leukaemia ; yr, year or years