

**Table 2.14. Case-control studies of benzene and Hodgkin's disease**

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
Bernard <i>et al.</i> , (1984), United Kingdom	All cases of lymphoma and leukaemia in adults diagnosed between October 1979 and December 1981 and resident within six health districts, both urban and rural, were included. There were 29 male and 19 female cases of HD.	For each case, a control matched for age, sex and geographic area was identified. The controls were without malignant disease and selected from the hospital in-patient population.	Cases were interviewed by one interviewer, as soon as possible after diagnosis, using a standard questionnaire including past occupation and hobbies and details of previous solvent and chemical contact.	HD 201	Benzene use	NA	1.0 (0.5-1.5)		
La Vecchia <i>et al.</i> , (1989), Italy	48 cases (29 males, 19 females) aged 15-74 with histologically confirmed diagnosis of HD.	396 subjects (269 males, 127 females, admitted for acute conditions to the same network of hospitals where cases had been identified.	Interviewer elicited history of occupations and occupational exposures. Information was collected on exposure to 13 selected occupational agents or groups of agents.	HD 201	Proportion exposed to solvents/benzene Cases 1-10 years >10 years Controls 1-10 years >10 years	(Percent) 2.9% 1.4% 2.5% 3.0%			Numbers of cases and controls in exposure categories not given.

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Gérin <i>et al.</i> , (1998) Canada	Between 1979 and 1986, 4,576 eligible male cases of 19 cancer sites (54 HD) ascertained from all the large hospitals in Montreal 3,730 (82%) agreed to participate; 82% of responses were obtained from the subject and the rest from a next-of-kin.	Men selected from electoral lists of the Montreal area, age-stratified to the age distribution of cancer patients. Of 740 selected, 533 (71%) were interviewed. For each case series, a pooled control group was formed by the addition of an additional 533 cancer controls selected randomly from eligible cancer cases to the 533 population controls.	Interviewers obtain a detailed description of each job the subject had in his working lifetime; chemists noted their confidence that the exposure occurred (possible, probable, definite), the frequency of exposure (less than 5% of the time, 5–30%, more than 30%), and the concentration of the agent in the environment (low, medium, high). These were then combined into exposure categories.	HD 201	Benzene Unexposed Ever exposed	42 12	1.0 1.2 (0.6-2.5)	Age, family income, ethnic group, cigarette smoking, and respondent status.	

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Raaschou-Nielsen <i>et al.</i> , (2001), Denmark	Children born after December 31,1959, diagnosed with malignant lymphoma (84 HD) under 15 years of age, 1968-1991, identified from the Danish cancer registry.	5 controls per case from the file of the Danish central population registry matched by age, sex and calendar time (1314)	Residential history from the Danish population registry, average concentration of benzene by application of a model.	HD 201	Benzene 1,000 ppb-days <0.5 0.5-<1.3 ≥1.3 Trend	34 30 19 83	1.0 1.7 (0.8-3.8) 4.3 (1.5-12.4) 1.8 (1.2-2.8)	Urban development, geographic region, type of residence, electromagnetic fields, mother's age, birth order	Trend analysis represents a doubling of exposure as a continuous variable
Seidler <i>et al.</i> , (2007), Germany	710 patients with lymphoma (participation rate 87%), identified in six participating areas. 115 had Hodgkins lymphoma	710 sex, region and age-matched (± 1 year of birth) population control drawn from the population registration office (44% participation rate).	Personal interview including job title, industry, and specific job tasks. A trained industrial physician subsequently assessed the intensity and frequency of exposure to specific chlorinated and aromatic hydrocarbons (including benzene).	HD 201	Benzene ppm-years 0 0-<8.6 8.6-<130 >130	101 9 5 0	1.0 1.0 (0.4-2.3) 0.9 (0.3-2.5) -	Age, sex, region, smoking and alcohol consumption	German component of the Epilymph study (Cocco <i>et al.</i> , 2010)