Results Women ever exposed to benzene had a significantly elevated risk of NHL (Hazard Ratio (HR) = 1.87, 95% CI = 1.19–2.96). Compared to unexposed women, significant trends in NHL risk were observed for increasing years of benzene exposure ($p_{trend} = 0.009$) and increasing cumulative exposure levels ($p_{trend} = 0.01$), with women in the highest duration and cumulative exposure tertiles having a significantly elevated association with NHL (HR = 2.07, 95% CI = 1.07–4.01 and HR = 2.16, 95% CI = 1.17–3.98, respectively).

Conclusions Our study is the first to our knowledge to evaluate this association in the context of a population-based prospective cohort of all women with diverse occupational histories. Our findings add to the evidence that benzene is associated with risk of NHL.

Method The contribution of occupational studies to the IARC monographs is reviewed.

Results Occupational epidemiology has made important contributions beyond developing knowledge to protect workers’ health, notably in identifying carcinogens of concern for the general population. The IARC Monographs have evaluated many carcinogens for which occupational studies have provided key evidence. The recent classifications of diesel engine exhaust, trichloroethylene and polychlorinated biphenyls (PCBs) as human carcinogens, which depended heavily on data from occupational studies, are illustrative. In the evaluation of PCBs, for example, occupational cohort studies showing an exposure-related increase in the risk of malignant melanoma were pivotal for the conclusion of sufficient evidence of carcinogenicity. Despite such noteworthy contributions, the number of occupational studies that are ultimately informative tends to be relatively small relative to the number reviewed. The most informative studies tend to have common features, including clear reporting of methods and results, well-defined outcomes, quantitative estimates of exposure, adequate control of major confounders, and state of the art analytical methods, often with internal analyses of exposure-response. In contrast, studies that are too broadly focused and those with crude classifications of exposure or outcome, analyses by external comparisons alone or poor reporting of the methods and results are often less informative in the final evaluation.

Conclusions While occupational studies are important for carcinogen identification, their relevance could be further enhanced with improvements in study design, methods and reporting.