

## **Diesel Motor Exhaust and Lung Cancer Risk in SYNERGY - Pooled Analysis of Case-control Studies on the Interaction of Occupational Carcinogens in the Development of Lung Cancer**

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**BACKGROUND:** Many workers are exposed to more than just one carcinogen during their working life and the synergistic effects of these carcinogens are largely unknown. This gap in knowledge impedes efficient primary prevention and fair compensation of diseased workers. The SYNERGY project, coordinated by the International Agency for Research on Cancer (IARC) and the Institute of Prevention and Occupational Medicine of the German Social Accident Insurance (IPA), started in 2007 to study synergistic effects of five selected occupational exposures (PAH, asbestos, crystalline silica, chromium, nickel) and smoking. Until the quantitative job-exposure matrix "ExpoSYN" is ready, we exploit the pooled epidemiological database for complementary analyses – here we present results regarding diesel motor exhaust (DME) classified by IARC as probably carcinogenic to humans. Our objective is to investigate the risk of lung cancer following occupational exposure to DME, while controlling for smoking and potential occupational confounders.

**METHODS:** The SYNERGY project pooled information on lifetime work histories and tobacco smoking from 13480 cases (10917 men, 2563 female) and 16511 controls (13154 men, 3357 female) from case-control studies conducted in 12 European countries and Canada. A job exposure matrix based on ISCO codes, assigning no (0), low (1) or high (2) exposure to DME was applied to determine level of exposure to DME. Odds ratios (OR) of lung cancer and 95% confidence intervals (CI) were estimated by unconditional logistic regression, adjusted for age, sex, study, education, pack-years and time since quitting smoking, and ever employment in a "Group A" job, i.e. occupations with established lung cancer risk.

**RESULTS:** Workers exposed to low levels of occupational DME exposure had an increased risk of lung cancer after 40 years of exposure OR 1.18 (95% CI 1.03-1.36), while workers exposed to high DME levels experienced a similar risk already after short duration (<10 years) OR 1.18, 95% CI 1.05-1.34. These results were similar in workers never employed in "List A" jobs, lending support to the assumption that confounding due to other occupational exposures was not responsible for the observed risk. Analyses in sub-populations of women and never-smokers also indicated an increased risk of lung cancer following occupational DME exposure.

**CONCLUSION:** Our results indicate that occupational exposure to DME is associated with an increased risk of lung cancer.