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LETTER

A comparison of occupational and non-occupational exposure to diesel exhausts and its consequences for studying health effects

Diesel exhausts are common both in occupational and non-occupational settings. They are considered as a cause of lung cancer, and International Agency for Research on Cancer (IARC) recently upgraded the evidence from probable to sufficient (http://www.iarc.fr). However, the opinions about the health effects are not consistent. A recent review concluded that the published studies lack consistency.1 A pooled analysis of case-control studies and a study of miners were interpreted as consistent with an increased risk but questioned by others.2 3 Some of the studies of lung cancer risk from diesel exhaust are evaluating the risk in drivers of vehicles like buses, trains or heavy equipment operators.1 2 4

The possibility to find an association in epidemiological study depends on the contrast in exposure between groups. We used nitrous dioxide as a marker of diesel exhausts and estimated exposure during working time (1700 h/year) and to commuting and so on (700 h/year) and to average concentration in the city (http://www.ivl.se).

Occupational exposure constituted 89%. The average concentration in the Stockholm area was reported to 350 μg/m3 indicating an average concentration of 53 μg/m3,6 indicating an occupational contribution of 29% in drivers (figure 1). These are the occupational contributions of diesel exhausts during a year in which the worker is occupationally active. If the life-time cumulative exposure would be estimated the occupational contribution would decrease considerably. The recent US study of miners found an average concentration of 128 μg/m3 elementary carbon in underground workers while the concentration for surface worker was only 1.7 μg/m3.3 However, if the lung cancer risk at the age of 70 is proportional to the life-time cumulative risk, the occupational contribution would be just about 50% for a worker who had worked 5 years underground in the mine and 70% if he had worked underground for 10 years.

We conclude that occupational studies of the risk with diesel exhausts would considerably underestimate the risk if they do not consider the non-occupational exposure. This especially concerns studies of modestly exposed groups like drivers in non-confined spaces.

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