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**LUNG CANCER RISK AT LOW ASBESTOS EXPOSURE:
META-REGRESSION OF THE EXPOSURE-RESPONSE
RELATIONSHIP**

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Objectives Most previous lung cancer studies focused on individuals heavily exposed to asbestos. Therefore, the existing estimated lung cancer risks per unit of exposure are mainly based on, and applicable to, high exposures. However, increasing interest lies in estimating risk at low exposures.

Methods We fitted linear and non-linear meta-regression models to 104 aggregated risk estimates extracted from 19 asbestos lung cancer studies. Associated RRs were calculated for several low cumulative asbestos exposure levels. The sensitivity of these RRs to the inclusion or exclusion of specific studies was assessed.

Results A natural spline model fitted our data best. With this model the relative lung cancer risk for cumulative exposures levels of 0.1 f-y/ml, 4 f-y/ml, and 40 f-y/ml was estimated to lie between 1.000 and 1.001, 1.013 and 1.027, and 1.13 and 1.30, respectively. After stratification by fibre type, a three to four-fold difference in RRs between chrysotile and amphibole fibres was found for exposures below 40 f-y/ml. Fibre type-specific risk estimates were strongly influenced by a few studies.

Conclusions The natural spline regression model indicated that at lower asbestos exposure levels, the increase in RR of lung cancer due to asbestos exposure may be larger than expected from previous meta-analyses. Heterogeneity in the results, however, limited accurate assessment of potency differences between different fibre types. Low exposed industry or population-based cohorts with quantitative estimates of asbestos exposure are required to substantiate the risk estimates at low exposure levels from our new, flexible meta-regression.