

Case-control study of radon and lung cancer in New Jersey

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Radon is known to cause lung cancer in humans; however, there remain uncertainties about the effects associated with residential exposures. This case-control study of residential radon and lung cancer was conducted in five counties in New Jersey and involved 561 cases and 740 controls. A year long alpha-track detector measurement of radon was completed for approximately 93% of all residences lived in at the time of interview (a total of 2,063). While the odds ratios (ORs) for whole data were suggestive of an increased risk for exposures $>75 \text{ Bq m}^{-3}$, these associations were not statistically significant. The adjusted excess OR (EOR) per 100 Bq m^{-3} was -0.13 (95% CI: -0.30 to 0.44) for males, 0.29 (95% CI: -0.12 to 1.70) for females and 0.05 (95% CI: -0.14 to 0.56) for all subjects combined. An analysis of radon effects by histological type of lung cancer showed that the OR was strongest for small/oat cell carcinomas in both males and females. There was no statistical heterogeneity of radon effects by demographic factors (age at disease occurrence, education level and type of respondent). Analysis by categories of smoking status, frequency or duration did not modify the risk estimates of radon on lung cancer. The findings of this study are consistent with an earlier population-based study of radon and lung cancer among New Jersey women, and with the North American pooling of case control radon seven studies, including the previous New Jersey study. Several uncertainties regarding radon measurements and assumptions of exposure history may have resulted in underestimation of a true exposure-response relationship.

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