Abstract

To investigate the lung cancer risk due to indoor radon a case-control study was conducted in Thuringia and Saxony (East Germany) from 1990 to 1997. Incident lung cancer patients recruited from cooperating hospitals, as well as a random sample of population controls were personally interviewed according to their complete residential, smoking and occupational history and other risk factors. Radon exposure was quantified based on measurements with two alpha-track detectors, placed for one year in the bedrooms and living-rooms of the current and former residences. The evaluation included 1053 cases and 1667 controls. A further evaluation included only subjects from regions with high and very high radon exposure.

In the study area an increase of the lung cancer risk with increasing exposure to radon is observed. The odds ratios (adjusted for smoking and asbestos exposure) referring to the one year measurements in the current residences are 0.97, 1.05 and 1.37 for 50-80, 80-140 and more than 140 Bq/m³ compared to 0-50 Bq/m³, the odds ratio for the highest exposure category being of borderline significance. Other quantifications render comparable risk estimators. An analysis restricted to regions with high and very high radon exposure partly shows statistically significant elevated risks.

The results of the study give additional evidence that indoor radon is a risk factor for lung cancer in the general population. The results are in accordance with a Swedish and a British investigation, with the result of a meta analysis including eight important published studies, as well as risk models from the analysis of cohorts of miners. Furthermore they confirm the results of an analysis in radon-prone areas within a case-control study conducted in West Germany.