

# Radon

The global incidence of [brain tumors](#) varies substantially without explanation. Studies correlating radon [exposure](#) and incidence are inconclusive. Particulate [pollution](#) has been linked to increased tumor [incidence](#). Particulates may disrupt the blood-brain barrier allowing intracranial exposure to oncogenic radon. Palmer et al. investigated the relationship between exposure to residential radon, particulate pollution, and brain tumor incidence in the [United States](#) (US).

County-level median radon testing results and annual air quality index values were obtained and divided into tertiles. Counties without both values were excluded. Four groups of counties were generated: high particulate/high radon (high/high), high/low, low/high, and low/low. Using incidence data from the Central Brain Tumor Registry of the US (provided by CDC's National Program of Cancer Registries and NCI's SEER), annual age-adjusted incidence rates (AAAIRs) by the group were generated by behavior. Incidence rate ratios were calculated to examine for significant differences ( $\alpha=0.05$ ). Poisson regression accounting for possible confounders was conducted.

Counties with available data included 83% of the US population. High/high exposure was significantly associated with increased AAAIR of all non-malignant tumors (up to 26% higher, including most meningiomas) even after accounting for potential confounders. An increased AAAIR was noted for all malignant tumors (up to 10% higher), including glioblastoma, but was negated after accounting for demographic/socioeconomic differences.

They present the first report suggesting increased non-malignant brain tumor incidence in regions with high particulate and radon exposure. These findings provide insight into unexplained variation in tumor incidence. Future studies are needed to validate these findings in other populations <sup>1)</sup>.

1)

Palmer JD, Prasad RN, Cioffi G, Kruchtko C, Zaorsky NG, Trifiletti DM, Gondi V, Brown PD, Perlow HK, Mishra MV, Chakravarti A, Barnholtz-Sloan JS, Ostrom QT. Exposure to Radon and Heavy Particulate Pollution and Incidence of Brain Tumors. *Neuro Oncol.* 2022 Jun 28:noac163. doi: 10.1093/neuonc/noac163. Epub ahead of print. PMID: 35762336.

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Last update: **2022/06/28 18:58**

