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ABSTRACT

An inhalation unit risk factor (URF) was developed for cadmium. The URF is based on excess lung cancer mortality in a key epidemiological study of cadmium smelter workers (Park et al., 2012). The Park et al. (2012) study is an update of the Thun et al. (1985) cohort that was previously used to derive a URF in USEPA (1985). Park et al. re-analyzed the cadmium smelter worker population (near Denver, CO) using more detailed work history information, a revised cadmium exposure matrix, a detailed retrospective exposure assessment for arsenic (potential confounder), and updated mortality data (through 2002). Grouped observed and expected number of lung cancer mortalities along with cumulative cadmium exposures were used in the current study to obtain the maximum likelihood estimate and asymptotic variance of the slope (β) for the linear multiplicative relative risk model using Poisson regression modeling. Life-table analyses were used to derive the final URF for cadmium of $4.9E-04$ per $\mu\text{g Cd}/\text{m}^3$. The corresponding lifetime air concentration at the 1 in 100,000 no significant excess risk level is $0.020 \mu\text{g Cd}/\text{m}^3$, which can be used to protect the general public in Texas against the potential carcinogenic effects from chronic exposure to cadmium and cadmium compounds.

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Key Words: cadmium; carcinogenicity; tumorigenesis; regulatory; cancer; inhalation

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