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Title

Standardized Mortality Ratios for Lung Cancer in the Canadian Uranium Workers Study (CANUWS)

Abstract

Previous studies show that uranium miners exposed to radon decay products have elevated lung cancer mortality. However, updated evidence on long-term lung cancer mortality risks from low-dose radiation exposure among Canadian uranium workers is needed. The Canadian Uranium Workers Study includes a cohort of around 80,000 workers from 1930–2018. With follow-up extended to 2020, this study provides an updated assessment of lung cancer mortality. We aim to estimate standardized mortality ratios stratified by age, calendar year, and sex.

This retrospective cohort study links data from multiple databases, including National Dose Registry, Personal tax file, National Cancer Incidence Reporting System, Canadian Cancer Registry, and the Canadian Vital Statistics Death. The cohort includes miners, millers, processors, refiners and fabricators from the Eldorado, Ontario, and Northern Saskatchewan. SMR will be calculated by comparing observed to expected lung cancer deaths among uranium workers based on national age, sex and calendar year-specific mortality rates.

Standardized mortality ratios will be estimated to assess whether lung cancer mortality among historic male uranium miners is higher than the general Canadian population, with planned analyses examining variation by work environment and employment period. Ongoing stratified analyses by age, sex, and calendar year aim to explore temporal changes in risk, including potential reductions among workers employed more recently under modern radiation protection standards. The comprehensive linkage of national data sources and follow-up to 2020 provides robust statistical power to detect differences in mortality patterns.

Lung cancer mortality among historic uranium miners will be evaluated, with ongoing and planned analyses examining potential differences by employment period and work environment. Continued research will provide important evidence to support radiation protection policies in Canada. This study represents the most comprehensive assessment of lung cancer mortality in Canadian uranium workers to date, providing an essential evidence base used to inform the radiation protection framework.