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Title

Standardized Incidence Ratios for lung cancer among the Canadian Uranium Workers Study (CANUWS)

Abstract

The Canadian uranium industry's extensive workforce data, spanning 1930–2018, linked to national cancer incidence databases, provides a unique opportunity to evaluate lung cancer risk from occupational radiation exposure. Previous research focused on historic uranium workers with higher radon progeny exposures, leaving uncertainty about long-term risks at lower exposure levels. The Canadian Uranium Workers Study will address these gaps by examining lung cancer risk in a national cohort of around 80,000 workers. A first objective of this study is to calculate standardized incidence ratios stratified by sex, age, and calendar year at risk to compare the lung cancer incidence among uranium workers with the general Canadian population.

This investigation links the Canadian cohort of uranium workers from 1930 to 2018, to the National Cancer Incidence Reporting System (NCIRS, 1969–1991) and the Canadian Cancer Registry (CCR, 1992–2010). We will calculate SIRs for lung cancer among uranium workers to compare their rates of lung cancer with the general Canadian population and conduct stratified analyses to identify potential risk patterns specific to different time periods, and different uranium mining, milling, and processing activities, as well as by sex and age group.

This study will generate standardized incidence ratios for lung cancer among Canadian uranium workers by sex, age at risk, and calendar period. Stratified analyses will characterize variation in lung cancer incidence across sub-cohorts and occupational settings, providing updated population-based risk estimates across historical and more recent exposure periods.

This research directly impacts Canadian radiation protection standards. This study provides a comprehensive analysis of lung cancer incidence in this workforce, providing an essential evidence base to support further analyses of the dose-response relationship between radon progeny exposure and lung cancer incidence. This work will help refine our understanding of radiation risk and assess the effectiveness of our occupational radiation protection programs.