

## Epidemiology:

November 2008 - Volume 19 - Issue 6 - pp S172-S173

doi: 10.1097/01.ede.0000340029.16019.55

Abstracts: ISEE 20th Annual Conference, Pasadena, California, October 12-16, 2008: Contributed Abstracts

## Lung Cancer Risk in Black-coal Miners with Pneumoconiosis in the Czech Republic

Tomaskova, H\*; Jirak, Z†; Splichalova, A\*; Urban, P‡; Holub, J§; Gromnica, R¶; Hajdukova, Z‖; Landecká, I<sup>#</sup>; Machartova, V<sup>\*\*</sup>; Korolova, E<sup>††</sup>

### Author Information

\*Institute of Public Health in Ostrava, Ostrava, Czech Republic; †University of Ostrava, Ostrava, Czech Republic; ‡National Institute of Public Health, Praha, Czech Republic; §Institute of Health Information and Statistics of the Czech Republic, Praha, Czech Republic; ¶Miner's Hospital, Ostrava, Czech Republic; ‖University Hospital with Polyclinic in Ostrava, Ostrava, Czech Republic; #Miner's Hospital in Karvina, Karvina, Czech Republic; \*\*University Hospital, Plzen, Czech Republic; and ††University Hospital, Hradec Kralove, Czech Republic.

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ISEE-959

### Objective:

In 1997 the International Agency for Research on Cancer evaluated dust containing crystalline silica as carcinogenic to humans (Group 1). The results of a great number of epidemiological studies confirm a statistically significant increase of lung cancer in the workers from various production areas with the risk of silicosis. The possibility of the increased risk of lung cancer in black-coal miners cannot be explicitly, according to the present knowledge, either confirmed or eliminated. Epidemiological investigation of association between silica exposure and lung cancer risk in workers with pneumoconiosis from all industries and settings with occupational exposure to silica is supported by grant of Czech Ministry of Health. The goal of this study is analysis of lung cancer risk between black-coal miners with pneumoconiosis and general population of the Czech Republic.

### Material and Methods:

The sample consisted of 2,511 black-coal miners with pneumoconiosis. These workers were registered in the National Register of Occupational Diseases from 1992 to 2001. The data on individual and occupational

history of workers were linked with the data from the National Cancer Register and the National Population Register. Population data were retrieved from Institute of Health Information and Statistics of the Czech Republic. Lung cancer risk was calculated as standardized morbidity ratio (SMR) with 95% confidence interval (CI) by 5-age groups based on the data on lung cancer incidence over a period 1992 to 2006, first group was 30–34 years and last group 85 years and more. Program Stata v.9 was used for data analysis.

### Results:

Coal workers' pneumoconiosis was diagnosed in average age of 48.8 years (SD = 12.5). Average time of exposure was 21.1 years (SD = 7.9) based on information about exposure found in 76.5% of sample. Concentration of SiO<sub>2</sub> in the black-coal mine's dust was less than 5% in 90% of sample and 5–10% in the rest of sample. Data on smoking habits were available from 73% of workers of those 65.6% were smokers or ex-smokers. In this sample 492 persons died in period 1992–2006 and average age of death was 67.0 years (SD = 12.2). Of those, lung cancer was the cause of death in 14.4%. The main causes of

death were cardiovascular diseases (39.4%). In total 91 lung cancer cases were diagnosed with average age of 63.6 years (SD = 9.2). Calculated SMR for lung cancer in miners with coal workers' pneumoconiosis was 2.2 (95%CI 1.8–2.8) comparing with the general Czech male population.

**Conclusion:**

This study found significantly higher lung cancer risk in workers with pneumoconiosis who were working in a mine comparing with general Czech population. More detail analysis of risk factors will follow.  
*Acknowledgment: The study has been supported by the Czech Ministry of Health–Nr. 8556 Longitudinal prospective study on carcinogenic risk in workers exposed to dust with content of crystalline form of silica dioxide in the Czech Republic (2005–2009).*

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