

## Poster-discussion: Silica

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**EXPOSURE AND LUNG FUNCTION IN TUNNEL WORKERS**

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**Objectives** Tunnel workers are exposed to a number of airborne contaminants. It has been proposed that exposure to particulate matter may result in pulmonary inflammation and lung function impairment. We hypothesised that exposure to particles and gases during tunnel drilling would cause lung function decline. The study is part of a larger epidemiological investigation.

**Methods** The investigation is designed as a 9 days follow-up of 90 tunnel workers and 51 controls (administrative personnel) working at the same construction sites, but without airborne occupational exposure. All subjects were examined with lung function tests and questionnaire shortly before their work period started and 9 days later. Blood samples were collected on both occasions. Personal exposure was assessed on two consecutive days between the two health examinations. The exposed workers carried sampling equipment for the determination of thoracic aerosol, elemental carbon, organic carbon,  $\alpha$ -quartz, nitrogen dioxide and oil mist. Concentrations of ammonia were measured with direct-reading electrochemical sensors.

**Results** The tunnel workers had a mean exposure to thoracic aerosol of 0.85 mg/m<sup>3</sup> (SD 1.19). The collected samples are currently being analysed for the other air contaminants. Forced expiratory volume in 1 s (FEV<sub>1</sub>) declined significantly by 64 ml (SD 169) in the exposed workers, in contrast to a non-significant decline of 4 ml in the referents. Non-smoking tunnel workers showed a significant decline of 55 ml (151).

**Conclusions** The exposed workers had a significantly increased pulmonary obstruction during the work period. Pneumoproteins and markers of inflammation are currently being analysed.