Lung function and progression of chest radiographic profusion among pneumoconiosis patients with different statuses of cigarette smoking in Hong Kong during 1981-2019

PI: Prof. Tse Lap Ah Shelly,
Professor and Associate Director (Mainland Affairs),
JC School of Public Health and Primary Care,
The Chinese University of Hong Kong

Aims:

- To examine the relationship between lung function and progression of radiological changes of pneumoconiosis by smoking status in a cohort of pneumoconiosis workers in Hong Kong
- To model the exposure-response relationship between changes of lung function and increasing years since smoking cessation from the period 1981-2005 by adding new pneumoconiosis patients confirmed during 2006-2019 and follow up till 2019

Background: Silicosis is among the most important occupational disease in Hong Kong. Pneumoconiosis patients have poor lung function and progressive lung impairment due to lung fibrosis.

Methodology:

Patient recruitment and follow-up

The cohort consisted of all pneumoconiosis workers who had been assessed at the Pneumoconiosis Clinic of the Tuberculosis and Chest Service of the Department of Health from 1981 to 2019. All eligible cases were followed up from their first clinic visit.

Lung function tests

Spirometric tests (FEV1, FVC, FEV1/FVC) were performed during the initial medical examination. Follow-up tests were conducted at two-year intervals for willing patients.

Radiographic silicosis

The presence of pneumoconiosis was defined by International Labor Organization (ILO) category using the ILO International Classification of Radiographs of Pneumoconiosis in 1980. This classification was used in categorizing disease severity.

Occupational exposure

After linking the individual occupations to the job-exposure matrix, the estimated silica dust exposure for each job duration was calculated by multiplying the exposure level. The cumulative dust exposure (mg/m3-year) was obtained by summing the exposures across all job episodes.

Impact: Results of the project provided important evidence-based guidelines for the medical surveillance of workers exposed to industrial dusts or with pneumoconiosis, informing policy-making to improve occupational health practice in Hong Kong.

Result and Conclusion:
Increasing severity of radiographic signs of silicosis workers was positively associated with loss of lung function, impaired spirometry, spirometric restriction, and all-cause mortality. Decreasing effects were observed among silicosis workers who had quit smoking longer ago. Meanwhile, the impaired spirometry itself was also an independent predictor of all-cause mortality. Results suggested smoking cessation is important in managing silicosis.