

Crystalline Silica Exposure in Tunnel Construction: Identifying Barriers to Safe Practices

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Abstract : Aim: This study aims to identify the barriers and challenges hindering the implementation of effective controls and the adoption of safe work practices to protect workers from respirable crystalline silica (RCS) exposure. Problem or Situation: Tunnelling is one of many occupations that expose workers to the harmful effects of respirable crystalline silica. Despite various control measures, such as engineering controls and personal protective equipment, exposures remain inadequately controlled, leading to incurable silicosis and other severe illnesses, such as lung cancer. Methods: The research involved surveying tunnel construction workers, conducting interviews, and facilitating focus group discussions. Additionally, site observations and content analysis of work procedures and instructions were performed. Results: Preliminary data analysis reveals notable findings. While there is a commendable level of knowledge and commitment among management and workers concerning RCS exposure in tunnelling, there is a striking lack of prioritization regarding dust control. Moreover, the risks associated with dust exposure are not sufficiently acknowledged. Additionally, the data suggests that engineers and supervisors responsible for implementing dust controls often possess limited knowledge regarding the factors influencing the effectiveness of these measures. These findings emphasise the need for a paradigm shift, including higher prioritisation of dust control, adoption of holistic dust reduction strategies, and enhanced knowledge about effective control measures. Conclusion: This research shed light on tunnel construction workers' barriers and challenges in protecting themselves from RCS exposure. This knowledge will be essential in developing interventions and strategies to enhance dust exposure and prevent the adverse health effects of respirable crystalline silica exposure in tunnelling and similar industries.

Keywords : respirable crystalline silica, dust control, worker practices, exposure prevention, silicosis

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