International Commission on Occupational Health - ICOH
Commission Internationale de la Santé au Travail - CIST
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Preventing Tuberculosis Among Silica Dust Exposed Workers

The International Commission on Occupational Health (ICOH) calls for a concerted global effort to promote Occupational Safety and Health strategies to prevent tuberculosis (TB) in high-risk occupations including silica dust exposed workers in mining, construction and other industries. The highest exposed are often the most vulnerable, disadvantaged, and medically underserved in countries with the highest burden of TB. We encourage governments, businesses, and global health funders to invest in control measures to prevent TB among silica-exposed workers consistent with the Moscow Declaration To End TB.

Silica Exposed Workers

Exposure to silica dust is a potent risk factor for TB, as demonstrated in multiple studies, notably among exposed miners and stone crushers (Churchyard 1999; Corbett 2000; NIOSH 2002). Silicosis, a lung disease caused by exposure to crystalline silica dust, is one of the most common occupational lung diseases worldwide (Chen 2012). In addition, silicosis increases the risk of active TB by up to four-fold, and HIV increases the risk approximately five-fold (Corbett 2000). The combination of silicosis and HIV produces a multiplicative effect, increasing the risk of acquiring active TB by 15 times greater than in individuals without silicosis and HIV (Corbett 2000). Furthermore, exposure to silica dust in the absence of clinically evident silicosis also has been demonstrated to increase the life-long risk for TB (Hnizdo 1998).

Silicosis is entirely preventable by reducing or eliminating exposures to silica dust in the workplace with improved ventilation and the use of wet methods. In small stone crusher mills in India with limited resources, water spray controls reduced respirable silica by 80% (Gottesfeld 2008). Reducing exposures to silica decreases the likelihood of developing silicosis, lung cancer and tuberculosis. The feasibility and efficacy of dust controls in reducing TB prevalence and mortality among exposed workers have been clearly demonstrated in multiple studies, including those from South Africa, Italy and the U.S. (Miners' Phthisis Prevention Committee 1937; Costello 1988; Cocco 1994).

Preventing silicosis by investing in engineering controls to reduce silica dust emissions is one of the most cost effective public health interventions in the workplace (Lahiri 2005). Accounting for TB, lung cancer, and other silica-related diseases in the analysis would further increase the cost-effectiveness

(ibid). Investments in dust controls in the workplace to prevent disease are more cost effective than investing in public health programs to identify and treat cases of TB (Dye 2006; Hunchangsith 2012).

The labor force at greatest risk includes the 227 million mostly informal, often migrant, workers in construction and mining (IGF 2017; Murie 2007). This estimate includes 40.5 million artisanal small-scale miners operating in more than 80 countries around the world (IGF 2017). At least one million children are employed in artisanal mining (ILO 2005). As many of these workers migrate to jobsites, the impacts of TB are often amplified in home communities.

In light of the overwhelming evidence linking the prevalence of silicosis and TB to silica exposure in occupational settings, the ICOH is calling for global action to reduce silica exposures in high-risk populations. Given the significant potential to prevent TB with silica dust controls in countries around the world, ICOH encourages governments, multilateral institutions, global health funders and businesses to invest and engage in the following:

Silica Dust Controls

- Governments and businesses should adopt action plans to reduce silica dust exposures in high-risk occupations including mining, quarries, construction, ceramics, foundries, and silica flour mills.

- Expand the scope of existing TB education and treatment programs to incorporate silica dust control measures in both large-scale industries and small-scale mining and stone crushing communities in high burden countries.

- UN Agencies and governments should promote dust controls to reduce silica exposures in small-scale gold mining operations as part of future projects focused on reducing mercury hazards under the Minamata Convention.

- Lending institutions and governments should increase loans, grants and tax incentives to encourage the installation of engineering controls to reduce silica exposures in mining and other industries significantly affected by these comorbidities of TB and silicosis.

- Governments and lending institutions should develop guidelines and specifications for large infrastructure projects to include specific requirements to control silica dust exposures.

- Employers and worker organizations should provide training programs illustrating safer work practices to reduce dust exposures.

Regulatory Approaches

- Governments should develop, adopt, disseminate and enforce regulations for controlling silica exposures in the workplace and invest in building capacity within relevant regulatory agencies.

- Governments should expand worker compensation programs to cover silicosis, TB and silicotuberculosis in both the formal and informal sectors. Costs for these programs to be passed on to employers to incentivize improvements in working conditions.

Building Capacity to Respond

- Increase research on the link between silica and tuberculosis and the efficacy of dust reduction efforts.

- Teaching and training institutions should expand training programs for health professionals to better recognize and diagnose silicosis and silicotuberculosis;

- The World Health Organization and International Labour Organization should revitalize and expand the Global Programme for the Elimination of Silicosis initiative and increase assistance to governments to adopt new regulations and establish silica reduction programs.

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