Introduction: Currently chrysotile asbestos is widely used in various industries, which determines the relevance of research aimed at the prevention of asbestos-related diseases. It is promising to determine the role of specific genes in the genetic predisposition to the disease.
Material and Methods: There were examined employees of JSC "Uralasbest" with an established diagnosis of asbestosis (n=94) and without lung diseases (n=200), dust exposure doses were calculated taking into account the percentage of time spent at the workplace during the shift for the entire time of work. SNPs IL1b (rs16944), IL4 (rs2243250), IL6 (rs1800795), TNFα (rs1800629), SOD2 (rs4880), GSTP1 (rs1610011), CAT (rs1001179) was detected. The research has been approved by the ethics committee of IRIOH. Data were analysed using Statistica.
Results: SNPs of the IL1b gene (OR=2.457, 95% CI=1.232-4.899) and the SOD2 gene (OR=1.705, 95% CI=1.055-2.756) were associated with the development of asbestosis. SNP of the IL4 gene was associated with asbestosis at lower values of dust exposure doses (OR=2.185, 95% CI=1.057-4.514). Associations of the IL4 and IL6 genes polymorphism with a more severe course of asbestosis, of the GSTP1 gene polymorphism with pleural lesions in asbestosis were established ($p<0.05$).
Conclusions: Genetic polymorphism of cytokines and antioxidant enzymes, which are directly involved in the pathogenetic mechanisms of asbestosis, contribute to the formation of a genetic predisposition to the development and severe course of asbestosis. Determination of these SNPs can be used to identify risk groups of asbestosis among workers.

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Preventing the global dust storm: key insights from regulating silica in a connected age

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Introduction: In 2015, WorkSafe Victoria received its first worker's compensation claims for silicosis in a stonemason which has since risen rapidly. The alarming re-emergence of this preventable disease began with the importation of engineered stone which was not matched by sufficient knowledge of its hazards and risk. This was exacerbated by the popularity of this product in the rapidly growing residential construction industry. Equally, the premature declaration of victory against silicosis and lack of international surveillance meant that its re-emergence was not detected until too late.
Material and Methods: Initial activities focused on understanding the scale of the issue. WorkSafe Victoria funded a free health assessment program for current and past stonemason's which diagnosed 169 workers with Silicosis. WorkSafe Victoria commissioned air monitoring at 20 stonemason workplaces and 270 stonemason workplaces were visited and 318 silica-related notices were issued for noncompliance with OHS legislation and regulations.
Results: This initial information informed WorkSafe Victoria to undertake further activities across the entire spectrum of the issue from the supply of engineered stone to medical professionals involved in diagnosing Silicosis in workers. Key achievements by WorkSafe Victoria have been the partnership with The Alfred for the first dedicated public hospital occupational respiratory clinic and the proposal of Crystalline Silica Regulations including a licencing scheme for engineered stone.
Conclusions: Overcoming this challenge has required an innovative approach in occupational disease prevention,

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Respiratory symptoms of workers in small roastery: Implementation of surveillance system

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Introduction: Flavors such as diacetyl are known to damage the lungs. Concerns have been raised about other types of flavors or coffee roasting workers, but evidence and experience are still lacking.
Materials and Methods: A 30-year-old male worker was referred to an occupational health clinic through the surveillance center for occupational poisoning prevention. He has been working in a small coffee roastery. Chief complaint was cough for a year. We found four other male workers with similar symptoms such as cough, chest tightness, sore throat or irritation, in different coffee roastery. Diagnostic tests were performed, including chest X-rays, chest high-resolution computed tomography (HRCT) and pulmonary function tests. We also conducted a survey of the workplace.
Results: All five workers were young male (range of age, 29 to 38). Their coffee roasting experience ranged from 11 months to 8 years. Common symptoms included cough, irritations of the nose and throat and chest tightness.
They were exposed to dust from coffee beans and packing materials and various volatile organic compounds while roasting coffee beans. There were no specific findings on chest HRCT and pulmonary function tests, but symptoms were much relieved after installing the local ventilators.
Conclusions: Workers may be exposed to various kinds of hazardous materials while roasting coffee beans. These substances may cause respiratory damage, but their health effects are not well known. It is important to establish occupational health surveillance system for early detection and prevention of occupational diseases.

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The Correlation between Occupational Pesticide Exposure with The Incidence of COPD and Chronic Bronchitis: a Systematic Review and Meta-Analysis

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Introduction: Chronic Obstructive Pulmonary Disease (COPD) is being one of the leading types of respiratory disease that being still increasing and expected to become the third leading cause of death by 2030. Approximately 74% of COPD type is chronic bronchitis. Pesticides have been showing to become important risk factors for COPD and chronic bronchitis among farmers.
Method: This study was reported based on PRISMA. A literature search was conducted using PubMed, Cochrane Library, scopus, and ScienceDirect. Odds Ratio (OR) with 95% CI were used to determine the odds of pesticide exposure with the case of COPD or chronic bronchitis and control. Random and Fixed effect Model was used based on heterogeneity.
Result: A total of 1410 studies was identified from all databases. We included 12 studies in qualitative synthesis and 10 studies were eligible for meta-analysis. The incidence of COPD was significantly higher in terms of insecticide exposure [OR=1.43(1.01,2.01), p=0.0008, I2=82%]. However there were no significant difference between the incidence of COPD for unspecified pesticide [OR=1.81(1.16,2.83), p=0.81, I2=0%] and herbicide exposure [OR=2.37(1.44,3.91), p=0.37, I2=0%]. Moreover there were no significant differences for chronic bronchitis due to insecticide [OR=1.17(1.06,1.28), p=0.72, I2=0%], unspecified pesticide [1.56(1.10,2.19), p=0.18, I2=41%], herbicide [0.94(0.83, 1.07), p=0.16, I2=40%].
Conclusion: This meta-analysis provided evidence that insecticide exposure was associated with COPD, but not herbicide and unspecified pesticide. Whereas there were no associations between chronic bronchitis and pesticide.

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Outbreak of silicosis in workers producing silica-based artificial kerbstones

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Introduction. An outbreak of silicosis occurred in a plant producing novel applications of silica-based composites despite periodic health surveillance.
Materials and methods: Five workers were referred to our clinic for occupational disease. Using past spirometry data from periodic health surveillance, we calculated individual yearly declines in FEV1 and FVC using robust multivariable linear regressions with adjustment for smoking cessation. Respirable quartz was measured in the workplace.
Results. The five men (38 to 59 years) had been employed for 8 to 30 years at a Belgian company where about ten workers made silica-based artificial kerbstones for hygienic wall protection. All were former smokers. We diagnosed enlarged mediastinal/hilar lymph nodes without radiological lung involvement in one worker, simple silicosis in two workers (one also with emphysema), and progressive massive fibrosis in two workers. Annual spirometries—but no chest X-rays—had been performed since 8 to 10 years prior to diagnosis. The four men with silicosis proved to have undergone too rapid declines in FEV1 (between 98 and 221 mL/year) and FVC (17 to 220 mL/year). High respirable quartz concentrations (>0.1 mg/m^3) were measured, especially during dry finishing of the cured kerbstones (1.080 mg/m^3). No personal respiratory protection was used.
Conclusions: The outbreak shows that the hazards of artificial stone production/processing reach beyond the kitchen/bathroom countertop industry. Increasing awareness, improving prevention and establishing workers' health surveillance programs—or improving the quality of existing programs—are crucial.

26. RURAL HEALTH: AGRICULTURE, PESTICIDES AND ORGANIC DUSTS

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Promoting OSH of aquatic agricultural workers through ergonomic design of a floating device

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Introduction: Throughout the various phases of the aquatic cultivation process, farmers remain immersed (up to waist or neck) for 5-6 hours/ day inside stagnant unhygienic water resulting in various health hazards. Farmers encounter major challenges when carrying out agricultural tasks (harvesting or weeds cleaning) in the waterbody with high depth. Small boats don't fulfill their purpose in many instances as it hinders task requirements and leads to awkward postures. They preferably make their arrangement of floating structure which always suffers from maintenance and safety issues. As the frugal design adopted by them is not robust and long-lasting, they need to prepare a new one every season. Hence, the present research aimed to design and develop a floating device to facilitate aquatic agricultural activities and reduce the concerned farmers' drudgery.
Material and Methods: Following a detailed field survey, the most feasible design concept was finalized through a participatory design approach, and the prototype was validated with field trials involving the farmers (n=15). The complete experimental design was performed according to the Helsinki protocol and endorsed by the institute's human ethics committee.
Results and Conclusions: User-centered design with the feasibility of local manufacturability/ maintenance was given due importance along with human factors. The developed prototype was evaluated in terms of usability, user compatibility, stability during floating, affordability, and sustainability. The designed floating device was rated high by the targeted users indicating the acceptance of the innovative des

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Mitigating the Hazards of Air Pollution on the Health of Rural Workers – Initiatives in India

Sashikala Chandrasekar