

Occupational respiratory disease in New Zealand sawmill workers: a longitudinal study

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Introduction:

The prevalence of asthma in New Zealand is one of the highest in the world. Wood dust is known to be associated with a range of respiratory effects including reduced lung function, increased bronchial responsiveness and occupational asthma. Cross-sectional studies in New Zealand have suggested an excess of asthma symptoms and lung function decline in sawmill workers. The aim of this study was to measure the incidence of asthma plus longitudinal changes in lung function, and to examine their associations with dust exposures.

Methods:

Associations between dust exposures, asthma symptoms and lung function were studied over three years in a prospective cohort of sawmill workers. Respiratory morbidity was assessed using spirometry and symptom questionnaires, and personal dust exposure was measured, initially on recruitment into the study and then annually for up to three years.

Results:

We recruited 283 sawmill workers from seven small to medium sized sawmills. Wood dust sampling (n=300) showed an overall average of GM=0.6 mg/m³ (range <0.1 to 16.9 mg/m³). There was a non-significant excess (OR=1.3) of asthma symptoms in workers with high exposure compared to the reference group with low exposures. In the longitudinal follow-up of workers an accelerated decline in FEV₁, PEF and MMEF was evident in the high exposure groups, when compared with the non/low-exposed. Although numbers were small, the decline over the 3 years in both FEV₁ and MMEF was statistically significant in the high exposure group.

Discussion:

This study confirms that New Zealand sawmill workers generally experience levels of dust exposure below most occupational exposure standards. Notwithstanding this, there is evidence of an increased risk of developing asthma symptoms and of lung function decline (of an obstructive nature) over time, with a suggestion of a dose-response relationship between dust levels and the development of symptoms.