

The IOM's position on occupational exposure limits for dust

The Institute of Occupational Medicine (IOM) considers that the current British occupational exposure limits for airborne dust are unsafe and employers should attempt to reduce exposures to help prevent further cases of respiratory disease amongst their workers.

The WATCH scientific advisory committee of the Health and Safety Executive (HSE) has advised that in their opinion current occupational exposure limits for inhalable and respirable dust are not safe. The evidence they examined suggests exposure to any poorly soluble dust, even at low doses, will affect lung function in a roughly linear fashion, i.e. increasing exposure will result in increasing adverse health effects. It was not possible for WATCH to identify a lower threshold below which there would be no lung function decline. The literature reviewed by the committee only considered in detail kaolin, carbon black and coalmine dust but it appears that they felt that the results could probably be generalised to all other low toxicity dusts.

This issue was also considered by the Advisory Committee on Toxic Substances (ACTS), who recommended an awareness raising campaign for those exposed to dusts to highlight possible risks to health. The trade union representatives on the committee dissented from this approach because they considered it was not sufficient and they have recommended that, as an interim measure, unions should follow a precautionary standard for inhalable dust and respirable dust.

At their December 2010 meeting the HSE Board considered these discussions and concluded that only limited benefits would accrue from reducing the exposure limits for airborne dust and that it would not therefore be seeking to do this in pursuit of a long-term reduction in respiratory disease.

We have a particular interest in this issue because much of the relevant research work was carried out at the Institute of Occupational Medicine (IOM) (for example, Soutar *et al*, 1997; Cullen *et al*, 2000; Tran *et al*, 2000) or elsewhere but including by staff who now work here (Gardiner *et al*, 2001, with van Tongeren as co-author). In this work we succeeded in developing a mathematical model of the quantitative toxic effects of inhaled dusts including coal dust, silica, and chemically inert dusts. These studies demonstrated that surface area is a major determinant of the toxicity of inhaled chemically inert dusts, and suggest that if there is a threshold for adverse effects it may be lower than the current limit values.

We are of the opinion that stricter limits can and should be applied. We note that HSE publicly states that:

- Around 15% of COPD may be caused or made worse by work
- 4000 COPD deaths every year may be related to work exposures

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- 40% of COPD patients are below retirement age
- A quarter of those with COPD who are below retirement age are unable to work

The most important cause of COPD is cigarette smoking.

If there is no threshold for the effects of dust on the lung then, as WATCH suggests, reducing exposure should *pro rata* reduce the risk of disease in the future.

IOM will adopt the following approach in advising its clients:

1. The current British limit values for respirable and inhalable dust (4 and 10 mg/m³, respectively) are unsafe and it would be prudent to reduce exposures as far below these limits as is reasonably practicable.
2. We suggest that, until safe limits are put in place, employers should aim to keep exposure to respirable dust below 1 mg/m³ and inhalable dust below 5 mg/m³.

IOM is committed to work with all interested stakeholders to encourage the development of scientifically robust standards for occupational exposure to airborne dust.

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References

Cullen RT, Tran L, Buchanan D, Davis JMG, Searl A, Jones AD, Donaldson K. (2000) Inhalation of poorly soluble particles. I. Differences in inflammatory response and clearance during exposure. *Inhalation Toxicology*; 12(12): 1089-1111.

Gardiner, K., van Tongeren, M. & Harrington, M. (2001) Respiratory health effects from exposure to carbon black: Results of the phase 2 and 3 cross sectional studies in the European carbon black manufacturing industry. *Occupational and Environmental Medicine*; 58(8): 496-503.

Soutar CA, Miller BG, Gregg N, Jones AD, Cullen RT, Bolton RT. (1997) Assessment of human risks from exposure to low toxicity occupational dusts. *Annals of Occupational Hygiene*; 41(2): 123-133.

Tran CL, Buchanan D, Cullen RT, Searl A, Jones AD, Donaldson K. (2000) Inhalation of poorly soluble particles II. Influence of particle surface area on inflammation and clearance. *Inhalation Toxicology*; 12(12): 1113-1126.