

REPLY TO THE FILTER FEATURE: MAY 2023 ON ASBESTOS

Deborah Glass, Peter Knott, Tracey Bence, Shelly Rowett

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This article brought interesting news about the EU proposal to reduce the exposure limit for exposure to Asbestos to 0.01 f/ml 8 hour TWA with fibre counting done by electron microscopy. (see [here](#)) This value is in stark contrast to Australian TWA of 0.1 f/ml and the position of SWA to exclude it from the WES review. It would be helpful to know the epidemiological or toxicological data that underlies the EU proposal as this was not apparent in the link provided nor was it explained in the article.

Some clarifications would be helpful to evaluate the science being presented. These are listed in the same order as the points appeared in the May 2023 [opinion piece](#) (page 49)

- 1. The LNT model is problematic:** The [Calabrese \(2022\)](#) article, is cited as casting doubt on the Linear No Threshold (LNT) model. However, this article is only about radiation exposure. It doesn't mention/pertain to asbestos. How is the fraud, manipulation and misconduct discussed by the Filter article and referenced to Calabrese, applicable to asbestos modelling?
- 2. Protective mechanisms:** We know that the body has important protective mechanisms. The individual's risk will depend on these. However, there are varying alleles of most genes and variation in the protective mechanisms that may well explain why some workers get cancer and others with apparently the same exposure do not. For the person who gets cancer, the protective mechanisms clearly haven't worked. It is not an argument that a threshold does not exist. It would be helpful for readers to see the references to data supporting a threshold for asbestos exposure.
- 3. Chronic inflammation:** We agree that persistence of fibres in the lung leads to persistent inflammation resulting in cancer. However, this is why exposure has to be reduced and presumably why mesotheliomas and lung cancer have long latent periods.

4. Dose response and LNT: A 2017 study measured thousands of asbestos bodies per gram of wet lung in asbestos affected individuals whose exposure had ceased years before.

If a person has inhaled thousands of fibres they will have more risk than someone who has inhaled few fibres. At the current Australian TWA of 0.1 f/ml people are 'permitted' to inhale millions of fibres. This is because asbestos exposure at 0.1 f/ml would be exposure to air containing 100,000 fibres/m³ and on average workers breathe 10 m³/day at work. This would result in inhaling 5,000,000 fibres per week or 220,000,000 per year (220 working days per year). Conservatively assuming that 50% of fibres are exhaled, rather than settling in the lung, this would still result in over 100,000,000 fibres in the lung per year, more than 4 billion over 20 years. When fibres remain in the lung for many years, it follows that more exposure results in more risk. Exposure at the lower 0.01 f/ml would still result in exposure to 10,000,000 fibres per year. This is not the same as the 1 fibre kills argument!

5. No increase in Mesothelioma at current exposure: Mesothelioma has a 40 year latent period. There are still around 700 cases per year being reported to the mesothelioma registry with little change since 2011. There may be less asbestos-related disease being caused in Australia now, likely because fewer people have asbestos exposure (reduced denominator) and perhaps also because exposure levels have been reduced. However, we won't see the results for many years.

Where there is exposure e.g. demolition or specific asbestos removal, and that which occurs when mining through naturally occurring asbestos such that the extent of exposure should be controlled. A reduced exposure limit such as 0.01 f/ml would be more protective than 0.1 f/ml, if it were implemented.

Fibre counting method: Yes, we may need more studies to compare the counts from Phase Contrast Microscopy (PCM) and Electron Microscopy (EM). The ACGIH set the limit at 0.1 f/ml in 1998 to prevent lung cancer, based largely on Peto's work in a UK textile factory using PCM to count fibres. In the ACGIH Threshold Limit Value ® supporting documentation it states that the available human and animal data could not establish a threshold for mesothelioma, using PCM. In 2014, Lippman suggested that EM should be used to accurately count and differentiate asbestos fibres.

6. For clarity and transparency to the readers, the authors of the filter article should cite references for the statement that "all the epidemiology studies used to determine risk ...". PCM is useful for asbestos removal clearance monitoring. We may need to use greater magnification offered by EM if we are to measure exposure accurately. Yes, EM does take longer, but many exposure measurements for carcinogens such as PAHs and respirable crystalline silica may need the most sensitive/ laboratory analysis for personal exposure calculation/assessment.

The authors state that they are unaware of any published evidence that reduction of exposure to 0.01 f/ml will significantly reduce ill health. However, the same could be said of almost all exposure limits - you won't find the data until reduction is implemented and the health effects measured after appropriately taking into account latency, confounding and bias.