

## Re: Asbestos and product defence science

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A recent editorial published by Terracini and Mirabelli in the *International Journal of Epidemiology*<sup>1</sup> addresses at length the controversy on carcinogenicity of chrysotile asbestos and the need to ban all types of asbestos.<sup>1</sup> Coupling these themes with a critique of our 2012 review on temporal aspects of asbestos exposure and risk of mesothelioma<sup>2</sup> is misleading, and conveys the message that we deny the carcinogenic effects of asbestos exposure or try to influence asbestos regulations in less developed countries, two false notions which are contradicted by the large body of literature that we have produced over several decades,<sup>3–7</sup> in particular on the carcinogenic effect of chrysotile.<sup>6,8</sup>

To attack anybody providing evidence falsifying predefined conclusions: this appears to be the approach of Terracini and Mirabelli,<sup>1</sup> two authors not alien to the judiciary system. Which kind of justice can be that evoked to generate partisan wisdom, a justice which manipulates the truth and forces the rules and guarantees of the legal system?

Science is good if it is capable of producing knowledge which is unbiased, generated according to appropriate methods, and therefore truthful. Any interference with the legal system judiciary would bias the nature of the scientific contribution, which is eminently cognitive. The evaluation of scientific evidence in the legal setting belongs to a different kingdom; those who generate and convey truthful knowledge into the legal and judiciary process are bound to the impartiality of the process. Failing to recognize the independence of the two areas is dangerous venture; Lysenkoism is just one historical example of the use of false science to support the legal persecution of innocents, including dissenting scientists.<sup>9</sup>

Objectivity, impartiality and adherence to the highest methodological standards have always driven our scientific practice, as shown by the consistency in our production for several decades. We stand behind any statement in our scientific articles, including those expressed in our 2012 review,<sup>2</sup> which was portrayed by Terracini and Mirabelli as

example of ‘defence science’. We have represented our scientific results across our career, as researchers, experts and consultants for defence, plaintiff or court.

The statement by Terracini and Mirabelli,<sup>1</sup> that the formula proposed by Peto and other authors<sup>10</sup>—which correlates the incidence of mesothelioma with the third or fourth power of time since first exposure, in addition to dose and type of fibre—does not imply that recent exposure periods have little impact on incidence of the disease, suggests a misunderstanding of the formula. Table 1 reports some examples of the effect of avoiding the last 10 years of long-term exposure on the incidence estimated at age 60 or 70, based on the formula, for exposures starting at age 20. Avoiding the last 10 years of exposure reduces the incidence of mesothelioma by less than 0.5% for exposures present at the time of diagnosis, and by between 2% and 6% for exposures ending 10 years before diagnosis. One can refute the formula by Peto *et al.*<sup>10</sup> and provide evidence supporting alternative models of the relationship between asbestos exposure and mesothelioma incidence (which Terracini and Mirabelli do not do), but cannot accuse us of misinterpreting and misusing the formula (which Terracini and Mirabelli do).

This is the third critique of our 2012 review published by these authors,<sup>11–12</sup> and we refer the interested reader to our previous rebuttal of their arguments.<sup>13</sup> That Terracini and Mirabelli feel compelled to repeatedly resort to specious accusations that we are merely producing ‘defence science’, only underscores their lack of ability to produce substantive responses to our conclusions.

Indeed, our review<sup>2</sup> which reviewed and discussed the role of stopping exposure on long-term asbestos risk, provides the scientific rationale for continuing surveillance of asbestos-exposed workers. Our conclusive sentences were: ‘Stopping exposure does not materially modify the risk of mesothelioma over subsequent decades. This is the reason for the still expanding mesothelioma epidemic across

**Table 1.** Difference in incidence of mesothelioma estimated according to the model by Peto *et al.*<sup>10</sup> in different scenarios of age at last exposure<sup>a</sup>

Age at mesothelioma incidence	Age at last exposure: default	Age at last exposure: alternative <sup>b</sup>	Difference in estimated incidence between default and alternative (%)
70	70	60	0.2
70	60	50	2.4
60	60	50	0.4
60	50	40	5.9

<sup>a</sup>Age at first exposure: 20 years; 4th power of temporal terms.

<sup>b</sup>Ignoring the last 10 years of exposure.

Europe,<sup>7,14</sup> despite the appreciable decrease in exposure to asbestos since the 1970s and the elimination of asbestos in most European countries since the early 1990s'. These sentences demonstrate our commitment to the study of the tragic long-term public health effects of massive asbestos use, even in countries which have eliminated asbestos use for several decades now, with the ultimate goal of producing solid evidence aimed at reducing the health consequences of past asbestos exposure. Respectful disagreement based on alternative interpretation of scientific evidence is part of the scientific discourse and contributes to advancement of knowledge, contrary to intentional misrepresentation of scientific findings, with or without the goal of influencing the judiciary process.

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