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Letter to the Editor

Letter concerning the paper by Finley and colleagues: dx.doi.org/10.1016/j.yrtph.2012.05.015

Dear Dr. Gori:

Having yesterday completed an invited peer-review of an asbestos-related paper for Regulatory Toxicology and Pharmacology, I think that it is appropriate for me to comment on the paper by Finley and colleagues entitled "Malignant Pleural Mesothelioma in U.S. Automotive Mechanics: Reported vs Expected Number of Cases from 1975 to 2007" recently published online (http://dx.doi.org/10.1016/j.yrtph.2012.05.015). The authors compared the number of malignant pleural mesothelioma (MPM) cases reported in the U.S. literature among auto mechanics between 1975–2007 to an expected value derived from estimated numbers of current and former auto mechanics. A total of 106 cases categorized as mesothelioma or malignant neoplasm of the pleura were found in the literature. Using background incidence rates for MPM of 2 and 3 cases per million individuals per year, they estimated that a range of 278–515 cases of non-asbestos-related MPM, respectively, would have occurred in current or former auto mechanics from 1975 to 2007. They concluded that their findings are consistent with the numerous epidemiology studies that have found no increased risk of MPM in auto mechanics.

It is my opinion that the analysis of Finley and colleagues is fatally flawed and that their results and conclusion are not credible. The fundamental epidemiologic error is that the "cases" and "controls" were not derived from the same sampling frame and are thus not comparable. The "cases" were derived from reports in the medical literature of mesothelioma among automotive mechanics; the person-years at risk (PYR), from which the expected number of cases was calculated, were computed from a population based sample of *all* automotive mechanics working in the United States. The authors have thus compared the experience of that (unknown) fraction of mechanics whose disease was reported in the literature to an expectation based upon the entire population of US mechanics. To provide a valid comparison, the authors should have compared the total number of cases of mesothelioma among US auto mechanics (unknown) to the expectation computed from the PYR of all US auto mechanics, or, compared the number of cases of mesothelioma reported in the literature to the expectation computed from the PYR of those auto mechanics described in the literature. There are enormous challenges to both these approaches, but the authors have failed in their attempt to compute a credible estimate from the hybrid approach.

It will be clear to all physicians and epidemiologists that the number of cases of any condition reported in the literature represent only a small fraction of those actually occurring. For example, I was asked in August 2008, by a plaintiff's attorney, to review a case of mesothelioma in an auto mechanic. Since that time, I have been asked to review an additional 28 cases of mesothelioma in friction workers. Not a single one of these 29 cases has been reported in the medical literature. Finley reports that he, or some of his colleagues, have been retained by defense attorneys in asbestos litigation. I estimate that there is a less than 0.1% probability that any of the friction cases that they consulted on have been reported in the literature. From our combined experience, the best estimate is that no cases of mesothelioma among auto mechanics have been reported in the literature.

The report by Finley and colleagues provides evidence that this estimate of a 0% reporting rate, based on the experience of two groups of consultants, is incorrect. It is appropriate then to undertake a sensitivity analysis of how the relative risk of mesothelioma among auto mechanics would vary according to the reporting rate of mesothelioma cases in the literature. Table 1 shows how the mortality rate ratio, or SMR, would vary according to the proportion of mesothelioma cases among mechanics that are actually reported in the literature. The Table shows that the reporting rate would have to be somewhat over 25% for the SMR for mesothelioma to equal 1. At higher rates of reporting, the SMR falls below 1 and reaches 0.2 at the level of reporting used by Finley and colleagues.

I leave it to you and your readers to guess as to the proportion of cases of mesothelioma among US auto mechanics that are reported in the literature and to extract your personal estimate of the SMR from the Table. My own guess is that less than 1 in 20 cases of MPM occurring among brake mechanics are reported in the literature. This would correspond to an SMR for pleural mesothelioma of 4 or higher. An increased risk of MPM in auto mechanics is consistent with the deposition and retention of Canadian asbestos fibers in the lungs of these workers (Finkelstein, 2008).

Table 1
Sensitivity analysis of observed vs expected cases of mesothelioma among US auto mechanics in which the reporting rate of cases in the literature is varied. Finley et al. found 106 cases. They estimated that 500 would be expected

Publication rate	Actual incidence	Expected	SMR
0.1%	1000 × 106 = 106,000	500	200
1%	100 × 106 = 10,600	500	20
5%	20 × 106 = 2120	500	4
10%	10 × 106 = 1060	500	2
25%	4 × 106 = 424	500	1
50%	2 × 106 = 212	500	0.4
100%	106	500	0.2

Conflict of interest

The author has worked as a consultant to plaintiff's lawyers in asbestos litigation.

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Reference

Finkelstein, M.M., 2008. Asbestos fibre concentrations in the lungs of brake workers: another look. Ann. Occup. Hyg. 52, 455–461.

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