# Chronological Trends in Asbestos-Associated Diseases: Fiber Analysis of 1150 Cases Over Four Decades

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## Abstract

Workplace exposures to asbestos in the US have been significantly curtailed since the establishment of exposure limits. We have been interested in the effects of these limits on the occurrence of asbestos-associated diseases, having examined lung asbestos content in 1,150 cases. Our methodology employs the sodium hypochlorite technique, with asbestos bodies (AB) counted by light microscopy and fiber types and concentrations determined by analytical scanning electron microscopy. The median AB count in 619 mesothelioma cases decreased from 1390 in the 1980s to 38 AB/gm in the 2010s. Most cases (91%) were related to amosite exposure, with median concentrations decreasing from 23,600 to 1,810 fibers/gm. Asbestos-related cases decreased from 90% to 54%. The median values for AB and fiber concentrations in asbestosis cases were similar for cases diagnosed in the 20th compared to the 21st century, but there were 141 such cases with fiber analysis in the 20th century compared to 37 cases in the 21st century. Similar trends were observed for 468 lung cancer cases, with 50% of cases meeting criteria for asbestos causation in the 1980s but only 13% in the 2010s. This study demonstrates the utility of electron microscopy for analysis of trends in lung asbestos content.

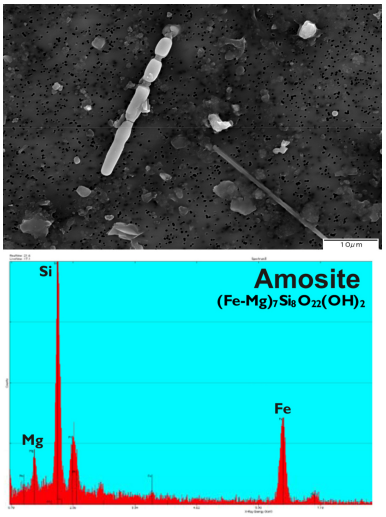


Figure 1. Secondary electron image of amosite asbestos body on Nuclepore filter isolated from lung tissue digest (top). Energy dispersive x-ray spectrum shows an elemental composition consistent with amosite asbestos (bottom).

## References

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